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THE JOURNAL  
OF THE  
UNIVERSITY OF ILLINOIS



UNIVERSITY OF ILLINOIS

PRESIDENT'S OFFICE.

# BULLETIN

...OF...

## THE SCHOOL OF PHARMACY

...OF...

NORTHWESTERN UNIVERSITY.



Next Regular School Session for the Admission of Students  
Begins April 12th, 1904.

NORTHWESTERN UNIVERSITY BUILDING  
CORNER LAKE AND DEARBORN STREETS, CHICAGO

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## **SCHOOL OF PHARMACY**

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### **NORTHWESTERN UNIVERSITY.**

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#### **THE FEDERAL FOOD AND DRUG LAW.**

A satisfactory national food and drug law has been passed by the House of Representatives and will doubtless be concurred in by the Senate. Its object is to prevent the sale of any article under a false name, as of oleomargarine under the name of butter, cotton-seed oil under the name of olive oil, one chemical compound for another, one drug or medicinal preparation for another, a half-strength article under the name of that of full strength, or injuriously impure or adulterated foodstuffs or drugs. The execution of this law is to be placed in the hands of the Bureau of Chemistry of the Department of Agriculture. Much of the analytical and microscopical work will be done by that Bureau in the beginning, but it will soon become necessary to employ a very large number of analysts all over the country to insure the full benefit of this wholesome measure.

#### **OCCUPATIONS OPEN TO GRADUATES OF THE SCHOOL OF PHARMACY OF NORTHWESTERN UNIVERSITY.**

Various occupations are more or less related to pharmacy in that they require in great part the same courses of preparatory training that are necessary to thorough pharmaceutical education. The courses given in the School of Pharmacy of Northwestern University open up to its students quite a num-

ber of occupations in which they can readily make practical use of their training. These occupations are very important ones, too. They are:

The Retail Drug Business as generally conducted.

Purely Professional-technical Pharmacy—not combined with any general merchandising.

The Wholesale Drug Trade.

The Trade in Chemical Apparatus and Supplies.

Pharmaceutical Manufacturing Laboratories.

Chemical Manufacturing Laboratories.

Establishments for the Manufacture of Industrial Chemical Products of all kinds.

Positions as Pharmacists in the Army, the Navy and the Marine-Hospital Service of the United States.

Analytical Chemistry and Microscopy in such lines of work as Commercial and Sanitary Public Analysts are called upon to do.

Graduates of this School are to be found in all the occupations mentioned.

The materials and products handled by persons engaged in these pursuits are to a very large extent the same, and a well grounded knowledge of their character and properties can be attained only by special courses of study and laboratory work. The groundwork of the training of a general chemist, a manufacturer of chemical or of medicinal products, a pharmacist, a perfume maker, a manufacturer of varnishes, an analytical chemist, is necessarily the same. Pharmacists have at all times more frequently than any other technical workers successfully undertaken miscellaneous related pursuits. They have become makers of alkaloids and related plant products; chemicals; medicinal preparations; sanitary and toilet preparations; perfumery; soaps; baking powders and flavoring extracts; paints; colors; pepsin and pancreatin and other digestive ferments; varnishes and polishes; and numerous other products of technological chemistry and chemical engineering. They have also become analytical chemists, performing such chemical and microscopical examinations as physicians require for purposes of diagnosis. They have been toxicological chemists. In the immediate future pharmacists will necessarily be required to possess such thorough training in chemical analysis that they can

be depended upon to do the vast amount of work which will be demanded by the food and drug laws and by the health authorities.

#### PROGRAM OF STUDIES FOR CHEMISTS AND MICROSCOPISTS.

Students desiring to prepare for the occupation of general, sanitary and commercial analytical chemists and microscopists are offered the following special program of work:

**BOTANY, PHARMACOGNOSY AND MICROSCOPY** (including the "waarenkunde" of the vegetable kingdom). Pharmaceutical, sanitary and commercial. Study of the external and internal structure of vegetable materials, whole and powdered, used as drugs, foodstuffs, spices, dyestuffs, and for other useful purposes. Lectures and recitations, 42 hours; laboratory work, 252 hours. Distributed over three terms of fourteen weeks each.

**INORGANIC CHEMISTRY.**—General, theoretical and descriptive. Experimental.

Qualitative inorganic analysis.

Quantitative inorganic analysis, volumetric and gravimetric; elementary and advanced.

These courses extend through five terms. Lectures and recitations, 98 hours; laboratory work, 588 hours.

**ORGANIC CHEMISTRY.**—General and Special. Lectures and recitations, 126 hours; laboratory work, 336 hours, 84 hours devoted to practice in the making of organic chemical preparations, and the remainder to pharmaceutical, sanitary and commercial organic analysis, including the valuation of drugs and medicinal preparations, the examination of water, milk, butter, cheese, oils, baking powders, alcoholic liquids, and other articles of commerce, and the valuation of pepsin and other digestive ferments. This work continues through two or three terms.

**MANUFACTURING.**—Study of materials, processes, apparatus, manipulations, general principles and products. Inorganic and organic. Pharmaceutical, chemical and miscellaneous technological work. Lectures and recitations through four terms, 126 hours; laboratory work, 336 hours.

**URINE ANALYSIS.**—A course of 84 hours laboratory work in one term of fourteen weeks.

**BACTERIOLOGY.**—Lectures and laboratory work through one term, 126 hours. **Optional.**

## GRADUATING EXERCISES IN DECEMBER, 1903.

The graduating exercises at the close of the fall term were held in the Assembly Hall of Northwestern University building, Friday afternoon of December 13. The principal address was delivered by Prof. Francis E. Lloyd, of the Teachers' College of Columbia University, New York, his subject being "The Scientific Attitude in Every Day Life." The graduates were:

## DEGREE OF PHARMACEUTICAL CHEMIST

Bonicel, Henry Victor .....Buenos Ayres, Argentine Republic  
Hammett, Charles Alfred .....Portchester, N. Y.

## DEGREE OF GRADUATE IN PHARMACY

Alt, Leo Nicholas .....Chicago  
Bates, Roy Edward .....Grinnell, Iowa  
Clothier, C. Roland .....Polo, Ill.  
Good, Leonard F. ....Salem, S. D.  
Hallam, Charles Percy .....Shabbona, Ill.  
Hieber, William Andrew Nicholas .....Chicago  
Klinck, Clifford LeMoyne .....Bristow, Iowa  
Kolar, Gustav Stanley .....Chicago  
Macomber, Arthur G. ....Cascade, Iowa  
Magoun, Walter C. ....Sioux City, Iowa  
Metzger, H. Clyde .....Cairo, Ill.  
Milne, Frank Alexander .....DuQuoin, Ill.  
Nolan, John Peter .....Chicago  
Pendergrast, John B. ....Hogansville, Ga.  
Potter, Maynard H. ....Piggott, Ark.  
Sheeran, Frank Clement .....Faribault, Minn.  
Sublett, Harold Watson .....Bowling Green, Ky.  
Thiedohr, W. Walter .....Streator, Ill.  
Wetzel, William Byron .....Waukegan, Ill.  
Wheeler, Clifton Damon .....Belvidere, Ill.  
Wray, Frank Pierce .....Pella, Iowa

## THE COMING SPRING TERM.

Many inquiries are received concerning the Spring Term which begins April 12. Students who begin their Junior work then will have their summer vacation during the whole month of August and the first twelve days of September. They can finish the whole course for the degree of Graduate in Pharmacy at the close of July, 1905.

## THE PHARMACY LAWS OF ALL THE STATES.

The following summary of the requirements of the Pharmacy Laws of the different States and Territories, as to age, experience, and examinations, is given for the information of those interested. It is corrected to September 1, 1903.

ALABAMA.—Registered Pharmacists must be 18 years of age. Graduates with four years' drug-store experience, are registered without examination. All others are examined.

Assistants and Apprentices are not recognized by the law.

ARKANSAS.—Registered Pharmacists must have three years' drug store experience, including time spent at a recognized College of Pharmacy.

Graduates of certain Colleges of Pharmacy are registered without examinations.

All other applicants are registered on examination only. But the examination questions of other State Boards, where the rating obtained is 70 per cent or over, are favorably considered by this Board and adopted as *its own examination*.

CALIFORNIA.—Registered Pharmacists must have four years' drug-store experience.

Assistant Pharmacists are not required to prove any drug-store experience.

All candidates for both grades must pass examination.

Apprentices have no legal existence.

COLORADO.—Registered Pharmacists must be 21 years of age and have four years' drug-store experience.

Assistant Pharmacists must be 16 years of age and have two years' drug-store experience.

All must pass examination.

Apprentices are not recognized.

CONNECTICUT.—Registered Pharmacists must have three years' drug-store experience. Graduates may be registered without examination at the discretion of the Board, but all others are examined.

Assistants and Apprentices are not mentioned in the law.

DELAWARE.—Registered Pharmacists and Assistant Pharmacists must be 21 years of age and have three years' drug-store experience.

Graduates in Pharmacy are registered without examination; all others are examined.

Apprentices are not mentioned.

DISTRICT OF COLUMBIA.—Registered Pharmacists must be 21 years of age and have four years' drug-store experience. Graduates in Pharmacy are registered without examination. All others are examined.

Assistants and Apprentices are not mentioned.

FLORIDA.—Registered Pharmacists must be 18 years of age and have three years' drug-store experience. All are examined

except graduates of Pharmaceutical Schools requiring four years' drug-store experience before graduation.

Assistants and Apprentices are not recognized by the law.

GEORGIA—Registered Pharmacists must have three years' drug-store experience unless they are Graduates in Pharmacy, in which case they are not required to have any drug-store experience. All must pass the examination.

Assistants and Apprentices are not recognized by the law.

IDAHO—Registered Pharmacists must have two years' drug-store experience and must pass the examination, unless Graduates in Pharmacy.

Assistant Pharmacists are registered without examination, the only requirement being two years' drug-store experience.

The law makes no mention of apprentices.

ILLINOIS—Registered Pharmacists must be 21 years of age and have four years' drug-store experience.

Assistant Pharmacists must be 18 years of age and have three years' drug-store experience.

Apprentices must be 15 years of age and have a general education equivalent to that required to enter High School.

All candidates for registration, whether Registered Pharmacists, Assistant Pharmacists or Apprentices, are examined by the Board.

The time of regular attendance at a School of Pharmacy is credited on the amount of experience required for registration in the grade of Assistant Pharmacist; but is not deducted from the four years' experience required for full registration. No credit is given for any drug-store experience acquired prior to the apprenticeship registration.

INDIANA—Registered Pharmacists and Assistants must be 18 years of age; but Registered Pharmacists must have four years' drug-store experience and Assistant Pharmacists two years.

Time of attendance at Pharmaceutical Schools is deducted from the experience required. All candidates must pass the Board examination.

The law makes no mention of apprentices.

IOWA—Registered Pharmacists must be 21 years of age and Assistant Pharmacists 18 years of age.

All candidates must pass the Board examination except Graduates in Pharmacy, who are registered without examination and without drug-store experience.

The law makes no mention of apprentices.

KANSAS—Registered Pharmacists must have four years' drug-store experience and Assistant Pharmacists two years.

Time of attendance at Pharmaceutical Schools, not to exceed two years, deducted from the experience required. All candidates must pass the Board examination, except graduates of approved Pharmaceutical Schools.

The law makes no mention of apprentices.

KENTUCKY—Registered Pharmacists must have three years' experience and must pass the Board examination.

Assistants and Apprentices are not recognized by the law.

LOUISIANA—Registered Pharmacists must be 21 years of age and Assistants 18 years of age. No drug-store experience is required, but all must pass the examination.

Apprenticeship is not regulated by the law.

MAINE—A Registered Pharmacist must have three years' experience or be a graduate of some regularly incorporated Medical College or College of Pharmacy. Graduates are registered without experience.

Assistant Pharmacists must be 18 years of age and have two years' drug-store experience or have completed the junior year in a Pharmacy Department of any incorporated College.

All are examined.

Apprenticeship is not regulated by the law.

MARYLAND—The Pharmacy Law of Maryland, approved April 8, 1902, is the latest. It applies to all of the state *except Talbot County*.

Pharmacists must be 21 years of age and have four years' drug-store experience.

Assistants must be 18 years of age and have two years' experience.

All candidates for registration are examined.

Apprenticeship is not regulated by the law.

MASSACHUSETTS—Registered Pharmacists must have three years' drug-store experience and must pass the Board examination.

Assistant Pharmacists and Apprentices are not registered.

MICHIGAN—Registered Pharmacists must be 18 years of age and have three years' drug-store experience.

Assistant Pharmacists must be 16 years of age and have two years' drug-store experience.

All must pass the Board examination.

The time of attendance at a Pharmaceutical School, not to exceed two years, is deducted from the amount of drug-store experience required for the grade of Registered Pharmacist.

The college time, not to exceed one year, is deducted from the experience required for the grade of Assistant Pharmacist.

Apprenticeship is not regulated by the law.

MINNESOTA—Registered Pharmacists must be 21 years of age and have four years' drug-store experience.

Assistant Pharmacists must be 18 years of age and have two years' drug-store experience.

All must pass the Board examination.

Time of attendance at Pharmaceutical Schools, not to exceed two years, is deducted from the required drug-store experience for both grades.

Apprenticeship is not regulated by the law.

MISSISSIPPI—Registered Pharmacists are licensed only upon passing an examination before the Board of Pharmacy.

Age and drug-store experience are not referred to.

Assistants and Apprentices are not mentioned in the law.

MISSOURI—Registered Pharmacists must be 18 years of age and have three years' drug-store experience.

All must pass the Board examination except graduates of Pharmaceutical Colleges requiring four years' practical experience before graduation.

Assistant Pharmacists and Apprentices have no legal existence.

MONTANA—Registered Pharmacists must be 21 years of age and have four years' drug-store experience.

Assistant Pharmacists must be 18 years of age and have two years' drug-store experience.

Time of attendance at Pharmaceutical Schools is deducted from the experience required. All must pass the Board examination.

Apprentices are not mentioned in the law.

NEBRASKA—Registered Pharmacists must be 18 years of age and have three years' drug-store experience, but the net time devoted to laboratory courses in Pharmaceutical Schools is deducted from the drug-store experience required.

All must pass the Board examination.

Assistants and Apprentices are not registered.

NEW HAMPSHIRE—Persons engaging in the drug business on their own account must pass an examination by the Commissioners of Pharmacy.

The law makes no mention of age or experience required of such persons, but they must be "skilled and learned in pharmacy." They are called "Pharmacists."

"Registered Assistants" are required by the law to be not less than 18 years of age, to have at least two years' drug store experience and to pass the "minor examination."

No qualifications are prescribed for apprentices.

NEW JERSEY—Registered Pharmacists must be 21 years of age and have four years' drug-store experience.

Assistant Pharmacists must be 18 years of age and have three years' drug-store experience.

Time of attendance at Pharmaceutical Schools, not to exceed two years, is deducted from the experience required. All must pass the Board examination.

Apprentices are not mentioned in the law.

NEW MEXICO—Registered Pharmacists must be 21 years of age and have three years' drug-store experience.

NEW YORK—Licensed Pharmacists must be at least 21 years of age and have had four years' practical experience and pass satisfactory examination.

Licensed Druggists must have had three years' practical experience and pass a satisfactory examination.

A Licensed Druggist may conduct a drug store in a village or place with less than 1,000 inhabitants and may also be in temporary charge of a licensed pharmacy, except in the city of New York, where they are not recognized.

Apprentices must be registered within three months after the beginning of such employment and must present evidence of having completed the eighth grammar school grade of this state, equivalent to within one year of graduation from public grammar school, or

an equivalent, in this or any other state, and be not less than 15 years of age.

No certificates of colleges or of states are recognized.

**NORTH CAROLINA**—Registered Pharmacists must have three years' drug-store experience and must pass the Board examination.

Assistants and Apprentices are not registered.

**NORTH DAKOTA**—Registered Pharmacists must be 21 years of age and have four years' experience.

Assistant Pharmacists must be 18 years of age and have two years' drug-store experience.

One-half of all time devoted to attendance at a School of Pharmacy is deducted from the drug-store experience required.

All candidates must pass the examination.

Apprentices are not mentioned in the law.

**OHIO**—Registered Pharmacists must be 21 years of age and have four years' drug-store experience.

Assistant Pharmacists must be 18 years of age and have two years' drug-store experience.

Apprentices are not mentioned in the law.

Time of attendance at Pharmaceutical Schools is deducted from the drug-store experience required; but not to exceed two years for the grade of Registered Pharmacist and not to exceed one and one-half years for the grade of Assistant Pharmacist.

All candidates must pass the Board examination.

Any person, without regard to preparatory education, may be employed as an apprentice.

**OREGON**—Registered Pharmacists must have three years' drug-store experience and Assistant Pharmacists two years' drug-store experience.

No age limit is fixed for Registered Pharmacists, but Assistants must be 18 years of age.

All must pass the Board examination.

Any person, without regard to preparatory education, may be employed as an apprentice.

**PENNSYLVANIA**—Registered Pharmacists must have four years' drug-store experience.

Assistant Pharmacists must have two years' drug-store experience.

All must pass the Board examination.

Any person, without regard to preparatory education, may be employed as an apprentice.

**RHODE ISLAND**—Registered Pharmacists must have three years' drug-store experience.

Assistant Pharmacists must also have three years' drug-store experience.

Graduates of approved Pharmaceutical Schools are registered without examination. All others are examined.

Any person, without regard to preparatory education, may be employed as an apprentice.

**SOUTH CAROLINA**—Registered Pharmacists must pass the Board examination, unless graduates of Pharmaceutical Schools approved by the Board. Three years' drug-store experience is required by the Board.

Assistants and Apprentices are not registered.

**SOUTH DAKOTA**—Registered Pharmacists must be 18 years of age and have three years' drug-store experience.

Assistant Pharmacists must be 18 years of age and have one year's drug-store experience.

Graduates of Pharmaceutical Schools are credited with two years of the experience required.

All candidates must pass the Board examination.

Any person, without regard to preparatory education, may be employed as an apprentice.

**TENNESSEE**—Registered Pharmacists must be 21 years of age and have four years' drug-store experience.

Assistant Pharmacists must be 18 years of age and have two years' drug-store experience.

Attendance at Pharmaceutical Schools is deducted from the experience required. All must pass the Board examination.

Any person, without regard to preparatory education, may be employed as an apprentice.

**TEXAS**—Registered Pharmacists must be 21 years of age and have three years' drug-store experience.

Assistant Pharmacists must be 18 years of age, but are not required to have any drug-store experience.

All must pass the Board examination except Graduates in Pharmacy who have had two years' experience.

Any person, without regard to preparatory education, may be employed as an apprentice.

**UTAH**—Registered Pharmacists must be 18 years of age and have four years' drug-store experience, except graduates.

Assistant Pharmacists must have two years' drug-store experience.

All candidates must pass the Board examination. Graduates required to have only three years' experience for registration in the grade of Registered Pharmacist.

Apprentices are not mentioned in the law.

**VERMONT**—Registered Pharmacists must be 21 years of age and have three years' drug-store experience.

Assistant Pharmacists are not required to have any drug-store experience.

All candidates must pass the Board examination except graduates of Schools of Pharmacy approved by the Board.

Apprentices are not mentioned in the law.

**VIRGINIA**—Registered Pharmacists must be 21 years of age and have four years' drug-store experience.

Assistant Pharmacists must be 18 years of age and have two years' drug-store experience.

All candidates for both grades are examined.

Apprentices are not mentioned in the law.

WASHINGTON—Graduates of approved schools of pharmacy are registered without examination. Others must pass the Board examination and must have three years' drugstore experience in order to become Registered Pharmacists.

Assistant Pharmacists must be at least 18 years of age, must have two years' drugstore experience and must pass the Board examination.

But the Board has power to register licentiates of other States without examination.

Apprentices are registered and must possess a preliminary education satisfactory to the Board.

WEST VIRGINIA—Registered Pharmacists must be 18 years of age and have three years' drug-store experience and must pass the Board examination, except graduates of Pharmaceutical Colleges, provided they have had four years' drug-store experience.

Apprentices are not mentioned in the law.

WISCONSIN—Registered Pharmacists must be 21 years of age and have five years' drug-store experience, college time included. Assistant Pharmacists must be 18 years of age and have two years' drug-store experience.

Time of attendance at Pharmaceutical Schools, not exceeding two years, deducted from the experience required.

All candidates for both grades must pass the examination.

Apprentices are not mentioned in the law.

WYOMING—Registered Pharmacists must have two years' drug-store experience and must pass the Board examination, except graduates of Pharmaceutical Schools approved by the Board.

Assistants and Apprentices are not registered.



## GRADUATES

1903

## DEGREE OF PHARMACEUTICAL CHEMIST.

Andrews, James Porter .....	Garrett, Ind.
Bonice, Henry Victor .....	Buenos Ayres, Argentine Republic
DeVine, Owen Crippen .....	Marietta, Ohio
Erickson, Hjalman Emil .....	Chicago
Farrar, Samuel McFarlan .....	Chicago
Frederickson, Walter Ennis .....	Ottumwa, Iowa
Girton, Lee Richmond .....	Madison, S. D.
Green, Carl Victor .....	Chicago
Hammett, Charles Alfred .....	Portchester, N. Y.
Johnson, Leonard Alfred .....	Bowling Green, Ky.
Kohn, Arthur Frederick .....	Chicago
Kovarik, Victor Godfried .....	Chicago
Megaw, Herschel Clarence .....	Owaneco
Miller, Oliver Jeremiah .....	Rockbridge
Rinde, Samuel Nelson .....	Grafton, N. D.
Sharpe, Howard Addison .....	Sussex, Wis.
Smith, Miss Eva Mary .....	Savanna
Spear, Benjamin .....	Chicago
Stacy, Edward Everett .....	Tuscola

## DEGREE OF GRADUATE IN PHARMACY.

Alt, Leo Nicholas .....	Chicago
Anding, Claude Ellis .....	Summit, Miss.
Andrews, James Porter .....	Garrett, Ind.
Arnold, Thomas Earle .....	Hastings, Neb.
Atterbery, Carlin .....	Chandlerville
Baillie, James William, Sc. B. ....	Effingham
Baltzer, Robert Herman .....	Hickman, Ky.
Bates, Roy Edward .....	Grinnell, Iowa
Boring, Eli W. Jr. ....	Salem
Brown, Samuel William .....	Ringwood
Buesch, Andrew Ernest .....	Dubuque, Iowa
Butler, Guy .....	Cambridge, Neb.
Childs, Frank Samuel .....	Keithsburg
Cline, John Vick .....	Marion
Clothier, C. Roland .....	Polo
Corner, Thomas John .....	Muston, Wis.
Cooley, Albert Simon .....	Savanna
Dean, Fred Julius .....	Waterman
DeVine, Owen Crippen .....	Marietta, Ohio
Douglas, Gerald Robert .....	Menno, S. D.
Dunne, Frank Hoe .....	Peoria
Elliott, Robert .....	Washington
Erickson, Hjalman Emil .....	Chicago
Farrar, Samuel McFarlan .....	Chicago
Felts, Harry B. ....	Barron, Wis.
Fettgather, Joseph J. ....	Dubuque, Iowa
Fleischer, Andrew William .....	Ossian, Iowa
Frantz, George Alton .....	Miller's Station, Pa.
Fredrickson, Walter E. ....	Ottumwa, Iowa

Gessner, Thomas	Springfield, Ill.
Gilbertson, Hubert Roy	Decorah, Iowa
Girton, Lee Richmond	Madison, S. D.
Good, Leonard F.	Salem, S. D.
Hallam, Charles Percy	Shabbona
Hammett, Charles Alfred	Portchester, N. Y.
Hartman, John Henry	Freeport
Hieber, William Andrew Nicholas	Chicago
Hill, David Wesley	Libertyville, Iowa
Hydinger, Henry	Hamburg, Iowa
Jaeger, Louis	Madison, Wis.
Jeffers, Mrs. Christine	Bellevue, Iowa
Keir, Archie Steward	Viroqua, Iowa
Klinck, Clifford Le Moyne	Bristow, Iowa
Kneever, Harry	Sheboygan, Wis.
Kolar, Gustav Stanley	Chicago
Kohn, Arthur Frederick	Chicago
Kovarik, Victor Bohumil	Chicago
Lamborn, Walter A.	Griswold, Iowa
Large, William Earle	Springfield
Lien, Frederick Charles	Hillsboro, N. D.
Locke, Burt Tuthill	Freeport
Loukota, James Adalbert	Schuyler, Neb.
Macomber, Arthur G.	Cascade, Iowa
Magoun, Walter C.	Somerville, Mass.
Malone, John William	Chicago
Martin, Samuel Vincent	Bancroft, Neb.
McClain, Harris Walker	Tripp, S. D.
McCleery, Daniel Ray	Pawnee City, Neb.
Megaw, Herschel Clarence	Owaneco
Metzger, H. Clyde	Cairo, Ill.
Michael, Edward	Chicago
Milne, Frank Alexander	Du Quoin
Milne, George Edmund	Morrison
Neely, John Wooford	Chicago
Nolan, John Peter	Chicago
Nywall, David Alfred, Sc. B.	Chicago
Obenland, Adolph Emil	Pomeroy, Wash.
Pendergrast, John B.	Hogansville, Ga.
Potter, Maynard H.	Piggott, Ark.
Pringle, Madge Isabelle	Marengo
Rachac, Adolph Louis	Cummings, N. D.
Reed, Paul Cresse	Lincoln
Reinboldt, August John	Manning, Iowa
Rinde, Samuel Nelson	Grafton, N. D.
Schmierer, Gustav	Scotland, S. D.
Seck, Ernest August	Evansville, Ind.
Sharpe, Howard Addison	Sussex, Wis.
Sheeran, Frank Clement	Faribault, Minn.
Simpson, William Edward	Pleasant Plains
Smith, Miss Eva Mary	Savanna
Spear, Benjamin	Chicago
Stacy, Edward Everett	Tuscola
Stahl, Miss Amanda Wilhelmina	Chicago

Steele, Claude Seymoure .....	Kentland, Ind.
Sublett, Harold Watson .....	Bowling Green, Ky.
Suddoth, Marion Aristides .....	Friar's Point, Miss.
Swanson, Carl Harry .....	Clarinda, Iowa
Tank, Julius .....	Manning, Iowa
Thiedohr, W. Walter .....	Streator
Turner, John Arthur .....	Antioch
Vick, Samuel Snider .....	Carterville
Vincent, Rowland E. ....	Letts, Iowa
Walker, C. Earl .....	Quincy
Wertz, Oscar Spencer .....	Sterling
Wetzel, William Byron .....	Waukegan
Wheeler, Clifton Damon .....	Belvidere
Whitby, Clement Marsh .....	Dubuque, Iowa
Wray, Frank Pierce .....	Pella, Iowa

### MATRICULATES.

Students in the first year are designated by the number 1; those in their second year's work by 2; and those in the special work of the course for the degree of Pharmaceutical Chemist by 3.

Alt, Leo Nicholas 2 .....	Chicago
Ambrose, Stephen Joseph 1 .....	Chicago
Anderson, Charlie John 2 .....	Valley City, N. D.
Andrews, James Porter 3 .....	Garrett, Ind.
Arduser, George 1 .....	Monticello, Iowa
Ayers, Otto Ellwood 1 .....	Ottumwa, Iowa
Bailey, Everett Webster 1 .....	Chamberlain, S. D.
Baisch, John Frederick 1 .....	Madison, Neb.
Bates, Roy Edward 2 .....	Grinnell, Iowa
Beans, Thomas Allen 1 .....	Crawford, Neb.
Benedict, Vincent 2 .....	Grand Rapids, Mich.
Berend, John Wallace 1 .....	Waterloo, Iowa
Bettine, Julius Alfred 1 .....	Charles City, Iowa
Blake, Charles William 1 .....	Ogden, Utah
Blount, Percy Thomas 1 .....	Ottumwa, Iowa
Bongart, Walter Michael 1 .....	Champaign
Bonice, Henry Victor 3 .....	Buenos Ayres, Argentine
Brean, Walter, T. 1 .....	North Chicago
Brooke, Harry Sargent 2 .....	Newark, N. J.
Burhop, Alfred* .....	Chicago
Burkett, Guy Fred 1 .....	Hawarden, Iowa
Burt, Hugh Valentine 2 .....	Chicago
Burton, Oscar 2 .....	Falmouth
Carroll, Edward 1 .....	Flanagan
Carty, Clarence Henry 1 .....	Park City, Utah
Cavanaugh, Arthur Lawrence 1 .....	Kewaunee
Chapman, Benjamin Craven 1 .....	Mattoon
Chilcote, Roy Waters 1 .....	Rosendale, Wis.
Cissell, Orville B. 2 .....	Toulon
Clark, Jay G. 2 .....	Mineola, Tex.
Claussen, Rudolph Henry 1 .....	Manning, Iowa
Claybaugh, Henry Lloyd 2 .....	Wayne, Neb.

\* Did not attend.

Claypool, William Edward 1 .....	Peoria
Clothier, Charles Roland 3 .....	Polo
Cohn, Edward A 1 .....	Chicago
Cooper, Howell Gazaway 2 .....	Lindale, Tex.
Cooper, Harry Talbot 2 .....	Robinson
Cowan, John G. 2 .....	Milford
Crosby, Ralph Carlos 1 .....	Aledo
Crowe, Thomas F. 1 .....	Chicago
Cunningham, James Lloyd 1 .....	Warren, Ohio
Davies, John Edward 2 .....	Spring Green, Wis.
Dayton, George B. 1 .....	Clinton, Iowa
Dedman, Thomas Curry 1 .....	Harrodsburg, Ky.
DeVine, Owen Crippen 3 .....	Marietta, Ohio
Dougherty, Jetta Byrne 1 .....	Newcastle, Neb.
Dubsky, Frank 2 .....	Chicago
Duncan, Howard William 2 .....	DeKalb
Duncan, Jennie Margaret 1 .....	Ottawa
Eberhardt, Henry Louis Jr. 1 .....	Chicago
Elder, James Walter 1 .....	Sweetwater, Tex.
Elliott, Delmar Clifford, 2 .....	Wilmington
Emerson, Charles Abbott 2 .....	McKinney, Tex.
Ennis, Lee Ebuck 1 .....	Oelwein, Iowa
Erickson, Hjalmar Emil 3 .....	Chicago
Evernden, William Blaine 1 .....	Hinsdale
Farrar, Henry T. 1 .....	Chicago
Farrar, Samuel McFarland 3 .....	Austin Station, Chicago
Farrington, Grover 1 .....	Mondovi, Wis.
Ferrell, Oran Luther 1 .....	Gilmer, Tex.
Feurbacher, Albert John Fred 1 .....	Lincoln
Fleischer, Andrew William 2 .....	Ossian, Iowa
Flemming, Edward William 2 .....	Laramie, Wyo.
Fox, Maurice 1 .....	Chicago
Fredrickson, Walter Ennis 3 .....	Ottumwa, Iowa
Freeman, Lewis Claude 1 .....	Chicago
Fritts, Roy Clifton .....	Metropolis
Fruitiger, Jacob Jr. 2 .....	Olney
Gibson, Harry Wentworth 1 .....	Evanston
Gilbert, Menzie Eli 1 .....	Mt. Vernon
Girton, Lee Richmond 3 .....	Madison, S. D.
Glenn, Thomas Michael 1 .....	Chicago
Good, Leonard Franklin 3 .....	Salem, S. D.
Gordon, Max Martin 1 .....	Chicago
Green, Carl Victor, Ph. G. 3 .....	Chicago
Greenwell, Elmer LeRoy 2 .....	Farmington
Gregg, Arthur William 2 .....	Bloomington
Grinnolds, Emma Maude 2 .....	Mauston, Wis.
Gunning, Charlie Albert 1 .....	Longmont, Colo.
Guthrie, William James 1 .....	Tacoma, Wash.
Hallahan, Arthur Thomas 1 .....	Baraboo, Wis.
Hallam, Percy Charles 2 .....	Shabbona
Hallett, Charles 1 .....	Greeley, Colo.
Hallock, Frank William 2 .....	Paw Paw
Hammett, Charles Alfred 3 .....	Portchester, N. Y.
Harlan, Lawrence Leon 1 .....	Hawarden, Iowa

Harrison, William Henry 2	Danville
Hartig, Albert Julius 2	Dubuque, Iowa
Hassett, Frank Martin 1	Clinton, Iowa
Heaton, Ruby Franklin 1	Circleville, Ind.
Hendrickson, Berent 2	Portland, N. D.
Hennings, Raleigh Myrtus 2	Albert Lea, Minn.
Hershey, Guy Floyd 1	Taylorville
Hieber, William Andrew Nicholas 2	Chicago
Higgins, Joseph C. 1	Madison, Wis.
Holke, William Henry 2	Freeport, Ill.
Holliday, William Warren 2	Wentworth, S. D.
Horton, Ira Maillor 1	Aurelia, Iowa
Hoyt, Sidney M. 1	Springfield, Neb.
Huntley, Roy 1	Sharon, Wis.
Hydinger, Henry 2	Hamburg, Iowa
Jaderstrom, Louis William 1	Kewaunee
Jeffers, Christine 3	Bellevue, Iowa
Jericho, Ernest 1	Mt. Pleasant, Iowa
Joder, Earl Bickley 2	Waterloo, Iowa
Johnson, Ever 1	Menominee, Wis.
Johnson, Ewing M. 1	Stonefort
Johnson, John Carl 2	Red Wing, Minn.
Johnson, Leonard Alfred 3	Bowling Green, Ky.
Johnston, Bernard E. 1	Chicago
Jones, Harper Patterson 1	Marshall, Tex.
Kackowski, Joseph 1	Chicago
Kassell, Albert Charles 1	Jacksonville
Kay, Carl Cecil 2	Big Sandy, Tex.
Keesecker, Frank Charles 2	Dubuque, Iowa
Keller, George Theodore 2	Orangeburg, S. C.
Kelly, Marcell Geneva 2	Dixon
Kempf, Fred F. 1	Monticello, Iowa
Kennedy, John Eugene 2	Chicago
Kiefer, Frank Rudolph 1	Quincy
Kierland, Lewis Richard 2	Rushford, Minn.
Kirk, Anna 2	Athena, Ore.
Klein, John 1	Hoopston
Kohn, Arthur Frederick 3	Chicago
Kolar, Gustav Stanley 3	Chicago
Klinck, Clifford Le Moyne 2	Bristow, Iowa
Kovarik, Victor Godfried 3	Chicago
Kozlowski, Benjamin Roman 2	Chicago
Kuehn, William 2	Chicago
Lambert, Charles Merrill 1	Hampton, Iowa
Lee, Arne E 1	Canton, S. D.
Leischner Eric P. 1	Wicker Park
Lewis, Arthur H. 1	Canton, S. D.
Lewis, Martin 2	Chicago
Lewis, Napoleon M. 1	Canton, S. D.
Locke, Wayne F. 1	Clinton, Iowa
Lonergan, Thomas J. 1	Waterloo, Iowa
Long, Charles I. 1	Cedar Falls, Iowa
Lyons, George Washington 1	Sullivan, Ind.
Lyons, John Drayton 1	Chicago

Maag, Emil Rudolph Felix 1 .....	Pana
Macomber, Arthur Gilbert 2 .....	Cascade, Iowa
Magoun, Walter Calvin 2 .....	Somerville, Mass.
Margadant, William 2 .....	Waterloo, Iowa
Mauro, Edmund 1 .....	Chicago
Mayer, John Arthur 2 .....	Freeport
McClarren, William Milton 1 .....	Washington, D. C.
McColl, Edward Roy 2 .....	Gresham, Ore.
McCullen, George A. 1 .....	Highmore, S. D.
McHugh, Grover 1 .....	El Paso
McLean, John Murdick 1 .....	Caldwell, Tex.
Megaw, Herschel, Clarence 3 .....	Owaneco
Menzies, Carl Edward 1 .....	Virginia
Merriman, Frederick Stoughton 3 .....	Moline
Merz, Lee Nichols 2 .....	Chicago
Metzger, Harry Clyde 2 .....	Cairo
Metzger, Royal Jacob 2 .....	Shellrock, Iowa
Meyer, Bertram M. 1 .....	Tecumseh, Mich.
Michael, Edward 3 .....	Chicago
Miller, James Emerson 2 .....	Atlantic, Iowa
Miller, Oliver Jeremiah 3 .....	Rockbridge
Milne, Frank Alexander 2 .....	Du Quoin
Milne, George Edmund 2 .....	Morrison
Moffitt, William R. 1 .....	Chillicothe
Mooney, John Hammel, 1 .....	Clinton, Iowa
Moore, William A. 2 .....	Danville
Moors, Claude W. 2 .....	Chicago
Morgan, Foster Clair 1 .....	Leon, Iowa
Morgan, Harmon Kiefer 1 .....	Clinton, Ind.
Morris, Sampson 2 .....	Chicago
Moyer, J. Walter 2 .....	Crawford, Neb.
Mulvey, Leo Irvine 1 .....	Denver, Colo.
Musselman, Claude John 1 .....	Danvers
Neeley, John Wooford 3 .....	Chicago
Neill, Frederick Winthrop 2 .....	Chandlerville
Nolan, John Peter 2 .....	Chicago
Nolan, Thomas James 1 .....	Spring Valley
Nowlin, Henry Briant 2 .....	Grand Saline, Tex.
O'Connor, Mary 2 .....	Lansing, Mich.
O'Malley, William 1 .....	Melrose Park
Pace, Grover 1 .....	Mondovi, Wis.
Palmer, Charles Earl 1 .....	Morrison
Parker, Ralph E. 1 .....	Sioux City, Iowa
Patterson, John Glover 1 .....	Springfield
Patton, Frederick Wills 2 .....	Waupun, Wis.
Pavlik, Anton Andrew 1 .....	Chicago
Pendergrast, John Brittan 2 .....	Hogansville, Ga.
Pepin, Louis Arthur 2 .....	Grand Rapids, Wis.
Phalen, Charles Stephen 1 .....	Harvard
Post, Theodore John 1 .....	Chicago
Potter, Dell Legare 1 .....	Neillsville, Wis.
Potter, Maynard H. 3 .....	Piggott, Ark.
Powell, Robert William 1 .....	Dubuque, Iowa
Praiss, Carl Franklin 1 .....	Faribault, Minn.

Prickett, Charles Caleb 2	Lewiston
Pringle, Madge Isabella 2	Marengo
Puhl, Adolph Albert 1	Menominee, Wis.
Purcell, Michael Joseph 1	Madison, Wis.
Pyles, John Lindsay 1	Fort Worth, Tex.
Read, Wade Hampton 1	York, Neb.
Reay, John Garfield 1	Wilmington
Redmond, James W. 1	Chippewa Falls, Wis.
Reisl, Edwin G. 1	Racine, Wis.
Riester, Clarence Edward 1	Chippewa Falls, Wis.
Riggs, Arlie B. 2	Mannington, W. Va.
Rinde, Samuel Nelson 3	Grafton, N. D.
Rink, Arthur Francis 2	Geneseo
Ritter, Frank 2	Mattoon
Roberts, Arthur J. 1	Wayne, Neb.
Robin, Samuel 1	Chicago
Roland, Ingwald Bernhardt 2	Menominee, Wis.
Ross, J. Leonard 2	Clinton, Iowa
Rugg, Roger Frank 1	Waterloo, Iowa
Ryerson, Peter Emerson 1	Broken Bow, Neb.
Saccar, Michael 2	Tripoli, Syria
Scharringhausen, George Larkey 1	Des Plaines
Schenk, Albert Leopold 1	Chicago
Schillinger, Carl August 2	Chicago
Schmidt, William Adolph 1	Madison, S. D.
Scott, Marc William 2	Chamberlain, S. D.
Senft, Frank 1	Chicago
Sharpe, Howard Addison 3	Sussex, Wis.
Sheeran, Frank Clement 2	Faribault, Minn.
Shennum, Arthur Clarence 2	Chicago
Sime, Hyman 2	Toledo, Iowa
Smith, Eugene Lyman 1	Chicago
Smith, Eva Mary 3	Savanna
Spaetgens, Henry Charles 2	Chicago
Spear, Benjamin 3	Chicago
Spear, Edward 2	Chicago
Speetzen, Gustav 2	Davenport, Iowa
Sprinkel, William Albert 1	Springfield
Squire, Mary E. 1	Chicago
Stach, Charles Albert 1	Chicago
Stacy, Edward Everett 3	Tuscola
Starrett, Roy Samuel 2	Manito
Stebbins, Arthur Percy 2	Barron, Wis.
Stepps, Victor Albert 1	Chicago
Stickrod, Henry Elmer 1	Danville
Stone, James Alexander 1	Monett, Mo.
Stowe, Edward E. 1	Chicago
Sublett, Harold Watson 2	Bowling Green, Ky.
Suddoth, Marion Aristides 3	Friar's Point, Miss.
Swartz, Alpha 1	Iowa Falls, Iowa
Tannus, Shukri Faris 2	Damascus, Syria
Taylor, James B. 1	Chicago
Techentin, Henry John 1	Chicago
Thiedohr, Walter 2	Streator

Thompson, George Hayward 2	Spring Valley
Thompson, Walter Herman 1	Decorah, Iowa
Thorp, Henry Lybrook 1	Chicago
Tompkins, Samuel Hershey 2	New Berlin
Toynnton, James H. 1	Geneva Junction, Wis.
Turner, Jesse Blaine, 2	Santa Ana, Cal.
Van de Bogart, Bert Ralph 1	Lake Geneva, Wis.
Van Vlack, Lewis Edward 1	Chicago
Virchow, John Emil Jr. 1	Aurora
Vlcek, Charles 2	Chicago
Wagner, Arthur Theodore 1	Dundee
Wallbaum, Carl Gerhard 1	Yankton, S. D.
Walz, Charles Arthur 1	Hartington, Neb.
Wangler, Anton Lotharins 2	Waterloo, Iowa
Warrington, Willie Brace Girdle 1	Pender, Neb.
Waterloo, Joseph Peters 1	Chicago
Watkins, LeRoy Anthony 2	Chicago
Weinberger, Albert Walter 1	Chicago
Weir, Frederick F. 1	Malakoff, Tex.
Weisenberger, Virgil DeLargay 1	Defiance, Ohio
Wellbrock, William 2	Peoria
Wetzel, William 2	Waukegan
Wheeler, Clifton Damon 3	Belvidere
White, John Calhoun Jr. 1	Hazelhurst, Miss.
Wilson, Charles Frazee 1	Rushville, Ind.
Wilson, Clarence Robert 2	Normal
Winner, Oliver F. 1	Sumner, Iowa
Wipperman, Otto DeLois 1	Grand Rapids, Wis.
Wise, Richard K. 1	Chicago
Witter, Clarence Porter 1	Capron
Woelke, John Henry 2	Los Angeles, Cal.
Wray, Frank Pierce 2	Pella Iowa
Wright, Donald Frasier 1	Tecumseh, Mich.
Wylie, Tracy John 2	Tampico
Young, Daniel Weber 2	Camden, Ark.
Zeletzny, Anna Mae 1	Chicago



## FACULTY OF THE SCHOOL OF PHARMACY OF NORTHWESTERN UNIVERSITY.

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EDMUND JANES JAMES, PH.D., LL.D.,  
*President of the University.*

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OSCAR OLDBERG, PHARM.D., DEAN,  
*Professor of Pharmacy and Director of the Pharmaceutical  
Laboratories.*

WILLIAM EDWARD QUINE, M.D.,  
*Emeritus Professor of Physiology, Therapeutics and Toxicology.*

HARRY MANN GORDIN, PH.D.,  
*Professor of Organic Chemistry and Director of the Organic  
Chemical Laboratory.*

THEODORE WHITTELSEY, PH.D.,  
*Professor of General and Analytical Inorganic Chemistry, and  
Director of the Inorganic Chemical Laboratories.*

RAYMOND H. POND, PH.D.,  
*Professor of Botany and Pharmacognosy and Director of the  
Microscopical Laboratory.*

MAURICE ASHBEL MINER, PHARM.M.,  
*Assistant Professor of Pharmacy.*

CHARLES WAGGENER PATTERSON, Sc.B., PH.C.,  
*Assistant Prof. of Analytical Pharmaceutical Chemistry. Registrar.*

HARRY KAHN, PHARM.M., M.D.,  
*Assistant Professor of Physiology and Materia Medica.*

DAVID CHARLES ECCLES, Sc.B., A.M.,  
*Instructor in Pharmacy. Secretary of the Faculty.*

GUSTAVE E. F. LUNDELL, Sc.B.,  
*Instructor in the Inorganic Chemical Laboratories.*

GERHARD H. JENSEN, Sc.B.,  
*Instructor in Botany and Pharmacography.*

JOHN FERD. FISCHNAR, PH.C.,  
*Assistant in the Pharmaceutical Laboratory.*

LEONARD A. JOHNSON, PH.C.,  
*Assistant in the Chemical Laboratory.*

---

ERNEST WOOLLETT,  
*Stenographer and Librarian.*

# THE SCHOOL OF PHARMACY OF NORTH- WESTERN UNIVERSITY.

(ILLINOIS COLLEGE OF PHARMACY, CHICAGO.)

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This is the largest university school of pharmacy in the United States. It has also the most extensive equipment and the largest staff of teachers exclusively devoted to the education of pharmacists.

The courses are thorough and practical and in accord with the highest standards attained in pharmaceutical education in this country.

Laboratory training, which is the most important feature of sound modern education for the practical work of pharmacy, is amply provided for in the workshops of this school. Northwestern University School of Pharmacy was the first American college of its kind to introduce laboratory courses in the study of drugs, and in the most important work the pharmacist has to do—the special work of preparing medicines in accordance with the prescriptions of physicians. The Dispensing Laboratory of this school has proved to be a most necessary part of the equipment, rendering it possible to supply in great measure at the college the practical instruction which it is becoming more and more difficult for the workers to obtain in the pharmacies.

The classes are drawn from all parts of the country.

One of the most important and distinguishing features of the organization and conduct of the School of Pharmacy of Northwestern University is the fact that its teachers devote their whole time and attention to their educational work and to the students of pharmacy exclusively.

In its new home, Northwestern University Building, on the southeast corner of Lake and Dearborn streets, the School of Pharmacy occupies the entire fourth floor, and an additional laboratory room on the first floor, and has more ample and convenient facilities than ever before. The building is 160 by 180 feet and six and one-half stories in height. It is provided with steam heat, electric lights and electric elevators.

It could not be more centrally located. It is conveniently accessible to the thousand drug stores of the city and suburbs, near the business places of the wholesale drug houses

and the dealers in chemical apparatus and supplies, and near all the principal stores of Chicago.

The splendid public libraries of this great city are within easy reach.

A quiet residence district, where satisfactory rooms and board can be readily secured at moderate rates, lies a few minutes walk from the University Building.

Eating houses abound throughout the center of the city, and an excellent lunch room is located on the first floor of the University Building itself.

### COURSES AND DEGREES.

Three distinct degrees in pharmacy are conferred by Northwestern University. These are the degrees of Graduate in Pharmacy, Pharmaceutical Chemist and Master of Pharmacy. The courses leading to these degrees are, respectively, as follows:

*Course for the degree of Graduate in Pharmacy.* This occupies four terms of fourteen weeks each, with full work requiring the student's whole time. The subjects studied are: General Pharmacy, Metrology and Pharmaceutical Mathematics, Nomenclature, Pharmacopœias and Dispensing, Inorganic and Organic Chemistry, Microscopy, Botany and Pharmacography, Human Anatomy and Physiology, and Materia Medica.

Laboratory courses are given in Elementary Experimental Chemistry, the production of Inorganic Pharmaceutical Preparations, Qualitative Analysis, Quantitative Analysis, the Official Processes of Drug Assaying, Vegetable Histology, and Pharmacography.

The laboratory work occupies from eighteen to twenty hours weekly through the whole course.

*Course for the degree of Pharmaceutical Chemist.* This occupies five terms of fourteen weeks each, with full work. It embraces all the work of the course for the degree of Graduate in Pharmacy, and, in addition further study of Organic Pharmaceutical Chemistry, the Pharmacopœias of the World, and other special courses.

Laboratory courses are given in the Preparation and Purification of Plant Constituents, Organic Chemical Preparations, Examination of Powders, Identification and Quantitative Estimation of Alkaloids, Examination of Milk, Butter, Fats and Oils, Soaps, Water, etc., and Urine Analysis.

The laboratory work occupies eighteen hours weekly during four terms and thirty hours weekly during the fifth term.

A good course in Bacteriology is also offered.

*Course for the Degree of Master of Pharmacy.* This course includes all the work of the other two degrees, following three years of full work in the College of Liberal Arts of the University. If in these three years all the courses prescribed for the bachelor's degree are satisfactorily completed and a total of one hundred semester hours of credit are secured, the degree of Bachelor of Science may be obtained upon the completion of the first year in the Pharmacy course and the Master's degree in pharmacy at the close of the second year.

### STUDENTS CAN ENTER IN SEPTEMBER, JANUARY OR APRIL.

The School of Pharmacy of Northwestern University is in active operation eleven months in each year. It is closed only in August.

The eleven months' annual session is divided into three terms of equal length.

The *Winter Term* begins immediately after New Year's Day and ends about the middle of April.

The *Spring Term* begins immediately after the close of the Winter Term and ends with the last week in July.

The *Fall Term* begins in the second week of September and ends just before the Christmas holidays.

Each term embraces fourteen weeks' work.

FOUR SUCH TERMS CONSTITUTE THE COURSE FOR THE DEGREE OF GRADUATE IN PHARMACY, and any student may begin that course at the beginning of any term and may take the four terms in immediate succession and graduate upon the completion of the work, or may take two terms annually as he may elect. Graduation exercises are held at the close of each term.

The object of this plan, whereby the school is practically in continuous operation, is to utilize its great equipment to the fullest extent practicable, and to enable the students to enter upon their course without unnecessary delay and continue it to completion without the six months' interruption customarily intervening between the Junior year and the Senior year in a majority of the professional and technical schools.

All subjects are taught in proper logical sequence, whether the student begins in January, April or September. This is accomplished by keeping the laboratories in continuous operation, and having a teaching staff so large as to enable the school to give each class an even greater share of attention than is possible under the customary system of conducting professional schools.

The conditions under which the student pursues his work in this School, from matriculation to graduation, will, therefore, both pedagogically and from the economic standpoint, be the most advantageous that can be realized, for he can make his rate of progress bear a just proportion to his ability and the time and means at his disposal at any stage of his college course.

Students can enter the school practically whenever most convenient to them, and complete their course for the degree of Graduate in Pharmacy within fifteen months if they so desire.

FIVE TERMS CONSTITUTE THE COURSE FOR THE DEGREE OF PHARMACEUTICAL CHEMIST.

### ADMISSION REQUIREMENTS.

All matriculants for the degree of *Graduate in Pharmacy* must possess a general education at least equivalent to that required for admission to a high school of the best grade.

Persons who have, *upon examination*, been registered by Boards of Pharmacy as pharmacists, assistants or apprentices, are admitted upon presentation of their certificates.

Matriculants for the degree of *Pharmaceutical Chemist* must possess a general education at least equivalent to that required for graduation from a high school of the best grade.

Matriculants for the degree of *Master of Pharmacy* must satisfy the requirements for admission to the College of Liberal Arts of this University, or prove an equivalent educational preparation approved by the Faculty of that college, and must have satisfactorily completed three years of full work in said college, or its satisfactory equivalent in some other recognized college. The subjects taken at the College of Liberal Arts may be selected from English, German, Latin, Mathematics, French, Physics, Chemistry, Botany and Zoology.

Students in the course for the degree of Master of Pharmacy take the course for the degree of Pharmaceutical Chemist modified and enlarged to correspond with their preparatory college work, and their studies at the School of Pharmacy occupy eighteen months. Upon satisfactory completion of the first year's work in the School of Pharmacy they may receive the degree of Bachelor of Science, and upon finishing the whole two years' course they receive the degree of Master of Pharmacy.

### GENERAL REQUIREMENTS.

The conditions of promotion and graduation include: Satisfactory deportment, due observance of the rules of the school, regular attendance during the full periods prescribed, satisfactory completion of the required work, good standing in the recitations and examinations throughout the courses, diligence and success in the laboratory work, payment in full of all dues, and the settlement of all accounts.

### CREDITS.

Any student presenting proper evidence of having satisfactorily completed in any other good school any one or more of the courses of study or laboratory work included in the curriculum of this school may, if desired, receive such credit therefor as may be consistent with the prescribed requirements.

Students of pharmacy who have completed the first year's work, or any part of the course, in any other reputable institution, may receive due credit therefor upon presentation of satisfactory credentials.

### EXPENSES AND DEPOSITS.

The matriculation fee, payable only once and before registration, is \$5. It is not returnable.

The tuition fee is \$40 for each term of fourteen weeks or \$80 for the Junior Course and \$80 for the Senior Course for the degree of Graduate in Pharmacy.

Students taking partial, divided or special courses, including those who are employed in drug stores, are required to pay tuition fees corresponding to the amount of school work taken by them.

The charge for materials (drugs, chemicals, etc.) consumed in the laboratory work is seven dollars per term.

A charge is made of one dollar per term for the use of microscopes, balances and other apparatus, and for their maintenance and replacement.

To cover the cost of apparatus lost, destroyed or damaged, and any damage wilfully or needlessly inflicted to building, furniture or other property, each student is required to make a deposit of \$5 before being assigned tables in the laboratories. This deposit is intended to cover the whole term and is in most cases sufficient for that purpose. But students who may damage or destroy apparatus or other college property to the value of more than the amount of their deposits will be required to make good the damage in addition. Deductions will be made from the deposit to cover the cost of avoidable loss or breakage and articles not returned.

Each student is charged for any damage or loss for which he is individually responsible and for his *pro rata* share of damage or loss the responsibility for which can not be individually located. The remainder of his deposit is returned to each student at the end of the term or whenever he discontinues his attendance at the school.

Text-books, note-books, laboratory aprons, towels, filter paper and any other articles not included in the outfits of apparatus, or not returnable, are furnished to the students at cost. But any student may purchase these books and articles wherever he sees fit.

Certain indispensable articles (not materials consumed) are necessarily furnished by the school for the convenience of students and to render the work effective and orderly. These articles include, for example, note-books, drawing-books, dissecting needles for use in the microscopical laboratory, aprons and sleeves, additional pieces of apparatus required to replace those broken or lost, etc. For this purpose each student is required to obtain a coupon ticket to the amount of \$5. Supplies of this kind are issued in no other way. Unused coupons are redeemed at the end of the year or whenever the student discontinues his attendance.

The diploma fee, payable not later than two weeks before graduation, is \$10.

The total cost of text-books for the entire course from the beginning of the Junior to the end of the Senior year, amounts to about thirty dollars. About one-third of these

books are required immediately upon entering for the first term, and the remainder may be procured from time to time as the courses progress.

Printed lists of these books with prices are furnished at the office of the school.

Individual lockers are rented to students at \$1 each. That rental covers the whole period of the student's uninterrupted attendance, whether that be one, or two, or three terms, from September to July, inclusive.

### THE LABORATORIES.

The School has seven laboratories.

1. The Manufacturing Laboratory, for practice in the production of chemicals and pharmaceutical preparations.

2. The General Chemical Laboratory, for the courses in qualitative inorganic analytical chemistry.

3. The Quantitative Inorganic Chemical Laboratory.

4. The Laboratory for Botany and Pharmacography, for the study of vegetable drugs and powders.

5. The Laboratory for Organic Analytical Chemistry, for instruction and practice in drug assaying, the identification and estimation of alkaloids, examination of pharmaceutical preparations, food analysis, sanitary analysis of water and other related work.

6. The Dispensing Laboratory for instruction and practice in the operations of compounding and dispensing medicines.

7. The Bacteriological Laboratory for practice in the technique of bacteriology.

Urine analysis is also provided for.

The furniture, fixtures, apparatus, instruments and all other appointments in these laboratories are new and complete, and it is believed that the equipment as a whole is superior to anything now existing in any other pharmaceutical college.

### THE LIBRARY.

The Library of the School of Pharmacy of Northwestern University contains the principal current chemical and pharmaceutical journals of the world, which are received as soon as published. It has complete sets of the *Archiv der Pharmacie*, *Proceedings of the American Pharmaceutical Association*, *British Pharmaceutical Journal*, and, since 1891, of the "*Berichte*" of the German Chemical and Pharma-

ceutical Societies, the "Chemisches Centralblatt," etc. The pharmacopæias of all countries and all important commentaries upon them are contained in the library, and all the most valuable reference works in chemistry, pharmacy, botany, pharmacognosy, physics, and related subjects, together with cyclopedias, dictionaries, formularies and other works necessary to students of pharmacy and of applied chemistry.

This library is open to all students at specified hours and the current journals are accessible to them at all times.

### THE MUSEUM.

The Museum contains several thousand plant drugs and related products, including many exceptionally valuable specimens exhibited at the World's Columbian Exposition in Chicago by the governments of Central and South American countries.

Extensive and valuable collections of chemicals and other preparations are also possessed by this school, including a great number of excellent products made in the laboratories by its students.

Students will have abundant opportunities to see and handle the most common and important drugs, chemicals, preparations and apparatus, that they may learn their appearance, names and uses, the object being to aid every student in acquiring as early in the course as practicable that degree of familiarity with these things which a pharmacist's apprentice may gain in the first year or two of his employment if he is fortunate enough to enjoy the help of a good preceptor.

### THE FACULTY.

Ten teachers and two assistants constitute the staff of this school. Nine of them have had several years' practical experience in pharmacy.

All the teachers, with but one exception, give their whole time to the School of Pharmacy.

Having no other students but the students of pharmacy, and giving their whole time and attention to these, the teachers are unhampered in their efforts to adapt all of their work, in the best way, to the special demands of scientific pharmacy, and the students receive a greater measure of individual attention.

## METHODS OF INSTRUCTION.

The courses of instruction are graded or progressive and as comprehensive as is consistent with thoroughness.

The methods of instruction include lectures, recitations and laboratory practice.

The lectures are illustrated by experiments, charts, apparatus, specimens, etc., as occasion requires.

Each student is assured as large a share as practicable of the individual attention of the teachers, and it is sought to make his work interesting as well as instructive, to cultivate his desire for knowledge and to teach correct methods for its acquisition.

All students are held to their appointed hours of school work and to the necessary text-book study.

Class exercises are conducted for the purpose of affording adequate practice in the solution of pharmaceutical problems, the use of technical nomenclature, the study of prescriptions and the recognition of drugs and preparations.

Laboratory work, which, in this school, occupies about two-thirds of the instruction hours, is a highly important feature of the courses, and at the same time constitutes the most profitable recreation the student can have.

## AMOUNT OF WORK.

Students taking the course for the degree of Graduate in Pharmacy are in attendance five days weekly, if they devote their whole time to their school work (that is, if they are not concurrently employed in drug stores or in other work not connected with the college courses); but students **concurrently** employed in drug stores attend about twenty hours.

Students who can give their undivided time to their college courses (in other words, those who are not obliged to earn their personal expenses by employment during their college attendance) are strongly advised *not* to devote any portion of their time to any kind of outside employment. A substantial course, such as given in this school, can not be successfully completed in fourteen months without undivided attention, and the amount of work required of full-time students is by no means greater than it should be to advantageously occupy their whole time.

On the other hand students employed in drug stores should not attempt to do the weekly work of full-time students, but should divide their studies so that the work done

will bear a proper proportion to the weekly school hours. In this school special arrangements are made to enable students to accept or retain outside employment (in drug stores or elsewhere) occupying a part of their time, so that they may carry as much of the school work as their time and ability permit. *The laboratory work alone* occupies, in this school, three full days weekly for all students who finish their course in fourteen months.

But students who correspondingly extend their college attendance accomplish all that is done by the full-time students, and the time card in this school has been made as convenient as possible. Clerks in the drug stores can come to the college in its new central location from any part of the city for one street car fare, and at noon they have time to visit wholesale drug stores for their employers if required.

Students employed in drug stores or engaged in other outside work during their college course may complete their work for the degree of Graduate in Pharmacy in five or six terms, according to the time at their command.

#### SEPARATE COURSES IN ANY DEPARTMENT.

Any student may take any one or more of the separate courses given in this school in Pharmacy, Botany, Inorganic Chemistry, Qualitative Analysis, Quantitative Analysis, Organic Analysis, Pharmacography, Dispensing, Urine Analysis, Bacteriology, or other subjects at his option, and will receive full credit for all such work when satisfactorily done. This applies both to the didactic courses and to the laboratory work. But no student will be received into the school for a less period than one term.

#### COURSES IN PHARMACY PRELIMINARY TO THE STUDY OF MEDICINE.

A large and increasing number of students intending to enter the medical profession take the courses in pharmacy in this school before beginning the study of medicine in order to lay a substantial foundation for their future work. A thorough, practical familiarity with drugs and medicines, and with their pharmacy, is invaluable to the practicing physician.

#### EMPLOYMENT FOR STUDENTS.

Students who desire partial employment in drug stores during their college attendance to enable them to earn their

expenses should send for the special circular relating to such employment.

Young men, who have had sufficient drug store experience, can easily find engagements.

A register is kept at the office of the school of students desiring positions and of employers desiring clerks, and special efforts will be made to provide satisfactorily for both.

## WOMEN IN PHARMACY.

Among the several occupations open to women pharmacy is peculiarly suitable, because it calls for just such qualifications as are naturally possessed by them, and because there is nothing properly belonging to the pharmacy that women may not accomplish quite as easily and perfectly as men. Care, precision, delicacy, deftness, scrupulous neatness, sobriety and faithful attention to details are absolutely essential to good and correct results in all pharmaceutical and chemical work.

Women being admitted to the classes, this school has a separate study and dressing room for their exclusive use.

## EARLY ENROLLMENT.

All the students intending to enter the college will find it a great advantage to write early for information and matriculate in good season.

There is always more or less rivalry among the students of all professional technical schools in the selection of lecture-room seats and laboratory tables. In this school, where the classes are very large, and where each student is assigned an individual desk in each of the several laboratories throughout his college attendance, it has been found necessary to adopt the rule that all students shall be entitled to their turn in the order in which they are enrolled, according to the dates of payment of fees. No student is allowed to select his lecture-room seat or laboratory desk until the whole class comes together at the beginning of the school session. The names of all of them are then called in the order in which they have secured their enrollment by the payment of \$5 (which is credited to them as a matriculation fee if new students, or on account of their laboratory deposit if already matriculates of this school), and each student is privileged to make his own choice.

## BOARD AND ROOM.

Very good board and room together can be secured near the school at from \$4 to \$6 per week. Students may also secure rooms and board separately. Information in regard to these matters and addresses of reliable and satisfactory private boarding places and furnished rooms will be supplied at the college. Good accommodations are plentiful, and satisfactory arrangements can be quickly made by each student immediately upon his arrival. It is wholly unnecessary and rarely advantageous to secure board and room in advance.

The Young Men's Christian Association has a special College Bureau for the professional schools of Northwestern University located in this building, and every student receives prompt, efficient and courteous personal attention and aid at that Bureau.

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For further information address the Dean of the School of Pharmacy, Northwestern University Building, 87 Lake Street, Chicago, Ill.



## SCHOOL CALENDAR FOR 1904.

Jan. 5	(Tues.)	Registration of Students for the Winter Term.
Jan. 7	(Thurs.)	Laboratories Opened.
April 9	(Sat.)	Laboratory Courses End.
April 11	(Mon.)	Examinations Begin.
April 12	(Tues.)	Registration of Students for the Spring Term.
April 14	(Thurs.)	Laboratories Opened.
April 19	(Tues.)	Graduating Exercises.
July 16	(Sat.)	Laboratory Courses End.
July 18	(Mon.)	Examinations Begin.
July 26	(Tues.)	Graduating Exercises.
Sept. 13	(Tues.)	Registration of Students of the Fall Term.
Sept. 15	(Thurs.)	Laboratories Opened.
Dec. 10	(Sat.)	Laboratory Courses End.
Dec. 12	(Mon.)	Examinations Begin.
Dec. 20	(Tues.)	Graduating Exercises.
1905.		
Jan. 3	(Tues.)	Registration of Students for the Winter Term.

N. B.—All students take their courses in regular order, whether they begin in January, April or September, all courses following each other in proper sequence.

There are four distinct classes started at the beginning of each term: One class consists of students who are just beginning the first half of the junior course; another class to take the second half of the junior course; a third class consists of students who are just beginning the senior course; a fourth class taking the second half of the senior course for the degree of Graduate in Pharmacy. Other classes taking courses for the degree of Pharmaceutical Chemist and special courses in chemistry and microscopy begin their annual courses in September.

## IMPORTANT SPECIAL NOTICE.

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Students may enter this school, to begin the junior course or the senior course, either April 12 or September 13, 1904.

The whole course for the degree of Graduate in Pharmacy occupies four school terms of fourteen weeks each. That for the degree of Pharmaceutical Chemist occupies five such terms.

The school is closed only in August.

Students are accordingly admitted at the beginning of either the Fall Term, Winter Term or Spring Term and may continue their work practically without interruption until completed.

Next School Term begins April 12, 1904.

The Fall Term begins September 13, 1904.

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THIS BULLETIN IS PUBLISHED QUARTERLY BY  
THE SCHOOL OF PHARMACY OF NORTH-  
WESTERN UNIVERSITY, CHICAGO.

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JUNE, 1904.

No. 1.

THE LIBRARY  
OF THE  
UNIVERSITY OF ILLINOIS



UNIVERSITY OF ILLINOIS

PRESIDENT'S OFFICE.

# BULLETIN

OF

## THE SCHOOL OF PHARMACY

OF

### NORTHWESTERN UNIVERSITY.



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Next Regular Session for the Admission of Students Begins  
September 12th, 1904.

NORTHWESTERN UNIVERSITY BUILDING,  
Corner Lake and Dearborn Streets. CHICAGO.

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Entered June 24, 1902, at Chicago, Illinois, as Second-Class Matter, under Act of  
Congress of July 16, 1894.

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UNIVERSITY OF ILLINOIS

PRESIDENT'S OFFICE

# **BULLETIN**

OF THE

## **SCHOOL OF PHARMACY**

OF

### **NORTHWESTERN UNIVERSITY.**

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#### **THE FIRST GUN.**

At last a beginning has been made to enforce or encourage proper special training for the occupation of pharmacy. The State Legislature of New York has enacted a bill giving recognition to college education in pharmacy, and the bill has been made a law by the governor's signature.

Hereafter all candidates for registration as pharmacists in the State of New York must be 21 years of age, must prove four years' practical experience in pharmacy, and must be graduates of pharmaceutical schools giving a course satisfactory to the Board of Regents of the University of the State of New York.

The ball has been started. Let us keep it rolling until all our States have similar laws, so that the profession of pharmacy shall rest upon a substantial basis.

#### **ANOTHER UNIVERSITY SCHOOL OF PHARMACY.**

The New York College of Pharmacy has become a department of Columbia University. Both institutions are to be congratulated. This union should be of decided advantage to the school of pharmacy, because the strength, independence and resources of the university are great.

Schools of pharmacy are now maintained by the State

Universities of California, Illinois, Iowa, Kansas, Maine, Michigan, Minnesota, Ohio and Wisconsin, and by Columbia, Northwestern, Purdue and Vanderbilt.

#### CHANGES IN THE PLAN OF OPERATION OF NORTHWESTERN UNIVERSITY SCHOOL OF PHARMACY.

In order to further increase the usefulness and efficiency of the School of Pharmacy, the whole time occupied by the course for the degree of graduate in pharmacy has been divided into three equal periods instead of four, each term being lengthened sufficiently to enable the student to finish that course in three terms instead of four, and the summer term has been set apart for the convenience of special students. The course for the degree of graduate in pharmacy may now be completed in three terms or semesters of eighteen weeks each, and the course for the degree of pharmaceutical chemist in four such terms or semesters. The tuition fees are practically unchanged, except that the total has been divided into three payments instead of two, which has incidentally resulted in a slight reduction of the whole amount. The fall term will begin at the usual time in the second week of September—this year on the 13th—and will continue until February. The second term or semester will begin February 3 and will continue until June 15. The dates for the admission of students taking the prescribed programs of work will, therefore, be September 12 and 13, 1904, and February 3 and 4, 1905.

A summer term of seven weeks will begin June 12, 1905. The courses of instruction which will be given during the summer term are referred to on page 27 of this Bulletin.

#### BUSINESS TRAINING AT THE SCHOOL OF PHARMACY.

Instruction in bookkeeping and in the necessary commercial transactions of business connected with the occupation of the druggist will hereafter constitute one of the features of the curriculum in the School of Pharmacy of Northwestern University. This course has been added without cost to the student.

#### A VALUABLE COURSE ON THE FINISHED MANUFACTURED PRODUCTS SUPPLIED BY PHARMACISTS.

Pharmacists are everywhere called upon to furnish to the community many necessary medical and sickroom sup-

plies which are made by manufacturers. Among these supplies are dressings, bandages, plasters, gauzes, dietetic preparations for children and invalids, sanitary appliances and preparations, valuable medicinal preparations such as can not be made by the pharmacist himself but which must be furnished by him, and often on the orders of physicians, and very many other things of a similar nature. The pharmacist should, therefore, have a sufficient knowledge of these products to handle them intelligently, serve his customers well, answer questions correctly, and to avoid as far as possible the causes of disappointment which are sure to attend the unintelligent vending of such goods.

The merchant who does not know what he is selling is certainly not successful. A dry goods merchant must be a good judge of dry goods, and a hardware merchant must be able to give reliable information concerning hardware. A pharmacist who sells infant foods and can not tell his customer anything concerning the character and uses of such preparations does not properly perform his duties. Again, certain kinds of medicinal products are perishable, and it is the pharmacist's business to know what products belong to that class so that he may avoid supplying spoiled or useless articles.

Instruction concerning matters along this line has probably not been included in the courses of lectures to students of pharmacy in the past, but this phase of the pharmacist's occupation is so important that careful attention to it will be given in the courses at the School of Pharmacy of Northwestern University.

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## ANNUAL MEETING OF THE ALUMNI ASSOCIATION—CLOSE OF A SUCCESSFUL YEAR.

The most successful year in the history of the Alumni Association came to an end Monday evening, April 18, at which time the annual meeting and election of officers was held. The meeting was largely attended. At the conclusion of the business session dainty refreshments were served and the new members (mostly members of the class just graduated) were welcomed.

The minutes of the meeting of December 4 were read and approved.

The reports of the retiring officers were received. President Wooten gave a resumé of the earnest work done by the organization's Executive Board during the past twelve months in its endeavor to make the association truly representative of the fifteen hundred alumni scattered throughout the United States and Canada. The following is extracted from the President's report:

#### CHANGE IN THE CONSTITUTION.

"The constitution and by-laws having been changed at the December meeting, so as to make the payment of annual dues of \$1.00 incumbent upon all members, I have sent out two letters on this subject, soliciting the dues for the year 1904. The net result of these letters to date, while they have been satisfactory in a measure, has not been all that could be desired.

"One letter was received calling in question the wisdom of the association's decision to collect annual dues, alleging that this arrangement was unjust to those who had become life members under the rule established when the association was formed. To this correspondent I gave as my opinion (an opinion I still entertain) that without the opportunity to use the money which we receive through the collection of annual dues, the doing of any work of real value by the association is practically out of the question. I have been a member of too many associations not to know that the only way to keep an organization thoroughly alive is to have enough money to run it properly. The funds that come in from new members are not sufficient to support the organization, because the more members the association has the greater the necessity for the organization's *doing something* to make membership in it of value—not *sentimental*, but *real* value. To make it of value will necessitate the expenditure of money, and this money should be collected in such a way as to insure a definite and permanent income.

"Of the 1,500 alumni of the School of Pharmacy, our association's membership represents a very small proportion. This has been due, to some extent, to a failure to solicit memberships before the various classes separated after graduation. An earnest effort should be made hereafter to secure the affiliation of all new alumni, and I would earnestly recommend that the officers persist in the effort we have recently made by means of correspondence to secure the affiliation of all who can possibly be induced to aid us in accomplishing the ends for which the association was formed.

#### ESTABLISHMENT OF A LIBRARY.

"For a number of years the association has had under consideration the establishment of a good library—one that will be a

credit to the school. It has been contended by many that this would be the best means of disposing of the funds which have accumulated in the past. To my mind this plan is one which can not be carried out without overcoming a good many obstacles, but I would recommend that a committee be appointed to investigate the subject thoroughly and report at the next meeting of the association.

"The work of straightening out the records of the association has received a great deal of attention at the hands of the Secretary, whose report will no doubt cover this subject fully. It is unfortunate that this feature of the association's work should not have received more careful handling in the past, and we must, by all means, carry on the activities of the association systematically and thoroughly in the future.

"This brings me to a discussion of the duties of the Secretary's office. These duties have not been arduous heretofore, but I am strongly in favor of paying the Secretary for whatever work is done on behalf of the association. There is no reason why a few persons should devote their time, energies and talents beyond ordinary limits to the association's welfare without being paid therefor. The best interests of the organization should be equally the charge of all its members; unreasonable sacrifices should be asked of no one.

"It is my opinion that the best method of having the association's work done is to employ an assistant secretary, whose sole duty it shall be to look after the work of the association. I am informed by the Dean of the Faculty that room for such an assistant can be provided in the room now being used as a library by the School of Pharmacy. The committee in whose hands is placed the question of the advisability of establishing a library could with propriety report upon this question of having the association's work done by a paid assistant secretary."

After discussing several live questions now engaging the minds of the pharmacists throughout the country, notably the revision of the patent laws as these laws relate to medicinal articles, the reduction of the tax on grain alcohol and the suggested changes in the pharmacy law of Illinois, Mr. Wooten concluded his address as follows:

"In conclusion, I am confident the membership will agree with me that the work of the association must be pushed from this time forward with resoluteness and vigor. It is certainly no credit to the Northwestern University School of Pharmacy to have an alumni association which numbers among its members so small a proportion of the alumni of the school, and I shall certainly expect every member to lend a willing hand toward making our organization thoroughly representative of all that is best in the school of which we are proud to be alumni, all that is best in modern pharmacy."

After some discussion the report was ordered spread upon the minutes.

Secretary Piper presented the following as her report for the period ended April 18, 1904:

# SECRETARY'S REPORT.

## RECEIPTS.

For membership fees.....	\$54.00
For annual dues.....	25.00
For certificates .....	9.00

Total ..... \$88.00

## DISBURSEMENTS.

Amount paid M. A. Miner, treasurer..... \$88.00

Balance on hand..... \$00.00

## MEMBERSHIP.

Number of members in good standing..... 250

New members received since December meeting..... 24

"Up to date the Alumni Association has had no mailing list, no record of its members, nothing from which items concerning members could be obtained, except the list in the Treasurer's books. The Secretary has had access to all the records of the University, and the Treasurer, and from these a complete list (alphabetically arranged) has been made, giving name, address, date of graduation, initiation fee paid, notices sent, general information, etc. This includes one list of members of the association and another of the entire number of graduates from the School of Pharmacy.

"Respectfully submitted,

"NINA C. PIPER, *Secretary.*"

Treasurer Miner presented the following as his report:

# TREASURER'S REPORT.

## RECEIPTS.

Cash on hand, December 4, 1903.....\$495.63

Interest from bank ..... 7.39

Cash from secretary for membership fees, annual dues and certificates, Dec. 4, 1903, to Jan. 18, 1904, inclusive ..... 88.00

Total .....\$591.02

## DISBURSEMENTS.

December 4, 1903, to April 18, 1904.

Printing, stationery, etc.....\$ 66.47

Addressing, folding, etc..... 3.96

Postage ..... 1.00

Balance on lunch at December meeting..... 8.26

Cabinet and cards for records..... 15.00

Total .....\$ 94.69

Balance on hand .....\$496.33

Cash in bank .....\$444.64

Cash in hands of treasurer..... 51.69

Total .....\$496.33

There are also in my hands eighty-eight notes on hand amounting to \$861.00 and the accrued interest.

Respectfully submitted,

M. A. MINER, *Treasurer.*

Professor Miner made a verbal report regarding the notes on hand, stating that a number of unsuccessful efforts to collect these notes had been made, that many of them were very old and that serious consideration should be given by the association as to what disposition should be made of them. (The reader will understand that these notes were taken in payment of the life membership fees which formerly constituted the organization's sole means of financial support.)

The reports of the Secretary and the Treasurer were referred to the incoming trustees for audit. The disposition of the notes referred to by Treasurer Miner was referred to the incoming executive board for such action as the board considered best.

Under the head of new business Mr. Tyler presented the following resolutions, which were unanimously adopted:

#### ENCOURAGE ORGANIZATION WORK.

WHEREAS the prosperity of the retail pharmacists of our country will continue to depend upon the earnestness and vigilance with which these pharmacists co-operate with each other in matters pertaining to their common welfare; therefore, by the Alumni Association of the Northwestern University School of Pharmacy, be it

*Resolved*, That we urge upon all members of the association that, in order to further their own best interests, they ally themselves with the American Pharmaceutical Association, the National Association of Retail Druggists, their several State pharmaceutical associations and with the local associations of pharmacists in their respective localities and devote their best energies to the task of making these organizations effective in accomplishing the objects for which they were created.

#### PATENTS ON MEDICINAL ARTICLES.

Upon motion of Mr. Adamick the following resolutions were, after considerable debate, adopted unanimously:

WHEREAS the pharmacists of the United States are overwhelmingly in favor of just and humane laws, and are convinced that the Mann bill now before Congress amending the statutes relating to patents upon medicinal articles is in the interest of the sick and suffering, and

WHEREAS the passage of this bill will prevent the granting of patents by the United States Government to citizens of any foreign country which does not grant corresponding patents to Americans, and prevent the patenting by anybody of medicines, patents being confined to processes rather than substances, and

WHEREAS we are confident this change in the patent laws would not work injury to any American manufacturer, who is entitled to protection, but on the contrary would prove an incentive to still greater achievements in the science of chemistry, rewarding as it does research and discovery when the present laws discourage; therefore, by the Alumni Association of the Northwestern University School of Pharmacy, be it

*Resolved*, That all members of the association are cordially urged to write to their representatives in Congress, asking them to vote for and actively support the Mann bill, known as H. R. 13679.

*Resolved*, That the executive board is instructed to use its best efforts to secure the enactment of such legislation co-operating with other pharmaceutical bodies to this end.

#### TAX ON ALCOHOL.

Mr. Patterson offered the following resolutions:

WHEREAS our internal revenue laws impose a tax of \$2.06 on each wine gallon of commercial alcohol, thus greatly increasing the cost of the substance and placing a heavy burden on the industries in which it is a necessary raw material; and

WHEREAS the reduction of the tax from \$1.10 to 70 cents per proof gallon (\$2.06 to \$1.31 per wine gallon) would greatly benefit the manufacturing industries of the country, and would cheapen the cost of many articles of general consumption; and

WHEREAS such tax reduction would result in practically no loss of revenue to the Government since, with a lower tax rate, the use of alcohol for manufacturing purposes would be greatly increased, and the illicit distillation of spirits from which no revenue is now derived would be made unprofitable; therefore, by the Alumni Association of Northwestern University School of Pharmacy be it

*Resolved*, That we heartily favor a reduction by Congress of the tax on alcohol to 70 cents per proof gallon.

*Resolved*, That the executive board is instructed to use its best efforts to secure the enactment of such legislation, calling upon the membership for assistance and co-operating with other pharmaceutical bodies for the accomplishment of the desired end.

These resolutions were adopted as read.

#### LIBRARY COMMITTEE.

Miss Walker introduced resolutions looking toward the appointment of a committee to devise ways and means to benefit the organization. As finally amended the resolutions were made to read as follows:

*Resolved*, That the President is directed to appoint a committee of three members, whose duty it shall be to decide upon the feasibility of establishing a library for the alumni association in conjunction with the library of the school of pharmacy, and of employing a salaried assistant secretary to attend exclusively to the clerical work of this association.

*Resolved*, That this committee is also instructed to canvass the various means that can be used to bring the association to a

more efficient state, through the expenditure of a portion of the funds now at interest.

Resolved, That the committee shall be known as the library committee and it is instructed to report fully at the June meeting of the association.

The president appointed as the library committee Mr. Adamick, Miss Stahl and Mr. Kasper.

The president announced that he, having been instructed at the last meeting to appoint a committee to consider the feasibility of adopting a class pin, would now announce that committee. The following were appointed: Mr. Tyler, Miss Walker and Mr. Shaper.

#### MR. BODEMANN'S ADDRESS.

The address of the evening was delivered by William Bodemann, of the Illinois State Board of Pharmacy, on the subject, "What's the Use of Belonging to the Alumni Association?" A hearty vote of thanks was tendered Mr. Bodemann for his entertaining and helpful address.

#### NEW OFFICERS.

The election of officers for the ensuing year being the next order of business, the following were duly elected and installed:

President—Thomas V. Wooten.

First Vice-President—Judson W. Hoover.

Second Vice-President—J. Elliott.

Third Vice-President—W. L. Barnum, Jr.

Secretary—Miss N. C. Piper.

Treasurer—M. A. Miner.

Trustees—Dr. H. Kahn, J. J. Gill, J. H. Montgomery.

After adjournment the members lingered for a considerable time, renewing old friendships and discussing the changes that had taken place in themselves and their fortunes since they were fellow students at No. 40 Dearborn street or at Twenty-fourth and Dearborn, and congratulating each other upon the present desirable location of the school and its increasing prosperity. The occasion was one long to be remembered by those who participated.

#### NEXT MEETING.

The next meeting of the association will be held Friday evening, June 17. At this meeting a carefully written and extremely valuable paper by D. F. Jones, Ph. G. (1895), Watertown, S. D., will be read and discussed. The subject of this paper is, "How to Build Up and Maintain a Good-Paying Prescription Business."

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## B R I E F

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# Description of the Courses

offered in the School of Pharmacy of Northwestern University for the Degrees of Graduate in Pharmacy, Pharmaceutical Chemist, Bachelor of Science and Master of Pharmacy, and for the training of Analytical Chemists and Microscopists.

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### COURSES OF INSTRUCTION AND LABORATORY PRACTICE FOR THE DEGREE OF GRADUATE IN PHARMACY.

(For courses leading to the degree of Pharmaceutical Chemist see p. 17.)

(For special courses in Chemistry and Microscopy see p. 18.)

**INORGANIC AND ANALYTICAL CHEMISTRY, 1.**—An introductory course in which the student lays the foundation necessary for successful work in the other courses in chemistry and in the courses in pharmacy. The elementary principles of the science are developed in connection with the consideration of oxygen, hydrogen, nitrogen and the other especially important non-metallic elements. This is followed by a systematic study of all the common chemical elements and their compounds.

Lectures, illustrated by experiments, three hours weekly; recitations, two hours weekly; through eighteen weeks.

This is accompanied in the laboratory by courses 2 and 3 A.

**INORGANIC AND ANALYTICAL CHEMISTRY, 2.**—*Laboratory Work in Elementary Chemistry.*—This course, together with the lectures and recitations described in course 3 A and course 1, form an integral course, the discussion of the theories of the science in the lecture room being based in large part on the experiments performed in the laboratory. There the student prepares the more important elements and their compounds and observes the physical and chemical properties of each. Since a perfunctory performance of the laboratory work is regarded as but little more than valueless, emphasis is laid on the logical and discriminating interpretation of the results of the experiments.

About twenty-seven laboratory periods of three hours each extending through about nine weeks.

INORGANIC AND ANALYTICAL CHEMISTRY, 3A.—*Qualitative Analysis* (Known Substances).—Study in the laboratory and class room of the methods of separation and identification of the principal bases and acids together with the reactions involved.

In this course the practical requirements of the pharmacist and chemist in the intelligent application of the identity and purity tests of the Pharmacopœia are kept in view.

About twenty-seven laboratory periods of three hours each, with recitations and written reviews, one or two hours weekly through nine weeks.

INORGANIC AND ANALYTICAL CHEMISTRY, 3B.—*Qualitative Analysis* (Unknown Substances).—The analysis of mixed substances, the composition of which is unknown to the student, and the detection of impurities in pharmaceutical and commercial chemicals.

Twenty-seven laboratory periods of three hours each through nine weeks.

INORGANIC AND ANALYTICAL CHEMISTRY, 4.—*Quantitative Analysis, Chiefly Volumetric*.—An introduction to the methods and underlying principles of quantitative analytical work through the study of typical methods. Due attention is paid to the use of the standard "volumetric test-solutions" of the pharmacopœia.

Twenty-seven laboratory periods of three hours each through nine weeks.

BOTANY, MICROSCOPY AND PHARMACOGNOSY, 1.—*General Botany*, including Organography and Taxonomy.—A course of lectures and recitations designed to give the student a good general conception of the great plant groups, to present the facts most essential to an intelligent study of vegetable drugs, to elaborate and recapitulate the lessons of the work in the microscopical laboratory, and to impart a knowledge of the classification of plants and the rules of nomenclature.

About two hours weekly through eighteen weeks.

BOTANY, MICROSCOPY AND PHARMACOGNOSY, 2A.—*The Microscope and How to Use It*.—A study of the optical properties of mirrors and lenses especially applied to the mechanism and manipulation of the compound microscope. Actual practice in manipulation is given, including methods of determining magnification.

The very best imported instruments with 1-inch and  $\frac{1}{4}$ -inch objectives, two eye-pieces, double nose-piece, coarse and fine adjustment, and all other important accessories are furnished to all students.

This course is a necessary preparation for courses 2B and 3.

BOTANY, MICROSCOPY AND PHARMACOGNOSY, 2B.—*The Microscopic Structure of Plants*.—A laboratory course especially designed to prepare the student for the examination of drugs and other vegetable raw materials with reference to the determination of their identity and quality, and for the detection of adulterations in

powdered substances. Particular emphasis is placed upon the anatomy of roots, stems and leaves. A special study is made of starch granules, aleurone and crystals. Each student is assigned a microscope for his own individual use and is furnished with an especially prepared laboratory guide. Cutting sections, preparation of mounts, and use of micro-reagents are daily practiced.

Five hours laboratory work weekly through eighteen weeks, including course 2A.

**BOTANY, MICROSCOPY AND PHARMACOGNOSY, 3.—*Pharmacognosy.***—A study of medicinally and industrially important plant substances. About two hundred of the most important drugs, spices and other raw materials of vegetable origin are thoroughly studied. A study is made of the outer and in many cases of the inner structure. Notes are made of the characteristic features, and spurious articles and adulterants also examined. Special effort is made to develop a capacity to intelligently interpret and apply the pharmacopœial descriptions for the identification of drugs and to form a correct judgment of their quality. Demonstrations are made from specimens of drugs and other substances likely to be confused with each other, but which may be distinguished by their respective structural differences.

The laboratory is abundantly supplied with materials, both dry and alcoholic, permanent mounts and choice museum specimens.

Five hours laboratory work weekly through eighteen weeks, with lectures and recitations one hour weekly.

**ORGANIC CHEMISTRY, 1.—*General and Pharmaceutical Organic Chemistry.***—A course of lectures and recitations on the general principles of organic chemistry with the study of the most important carbon compounds and their classification. Particular attention is given to substances employed in medicine and pharmacy, such as the important alcohols, ethers, aldehydes, acids, chloroform, choral, certain compounds of the aromatic series, the so-called "synthetics" of the newer materia medica, etc.

About ninety lectures and recitations, extending through eighteen weeks.

**ORGANIC CHEMISTRY, 2.—*Drug Assaying.***—Laboratory training in the performance of the processes prescribed in the pharmacopœia for the assaying of drugs and their preparations.

Thirty-six laboratory periods of three hours each extending through eighteen weeks.

**HUMAN ANATOMY AND PHYSIOLOGY.**—This course is intended to sufficiently acquaint the student with the morphology and physiology of the human body to enable him to understand the processes of digestion, assimilation, circulation, respiration and nerve action, and the physiological action of drugs.

A course of eighteen lectures and recitations.

**MATERIA MEDICA AND THERAPEUTICS.**—About thirty-six lectures and recitations on the properties, action, uses and doses of drugs and their preparations, together with a discussion of poisons and their toxic effects and antidotes.

**PHARMACY AND MANUFACTURING, 1.**—*Weights, Measures and Pharmaceutical Arithmetic.*—Principles of metrology. The metric system. The customary weights and measures of America and Great Britain. Weighing and measuring. Balances and weights. Specific weight and specific volume. Instruments employed in determining mass and volume and their relations. Working formulas expressed in fixed quantities and in “parts by weight.”

Actual practice in pharmaceutical problems connected with the metric system; the relations of weight and volume; percentage strength; problems in diluting and strengthening alcohol solutions and preparations, and other calculations commonly occurring in pharmaceutical work and in manufacturing.

The importance of this course is best understood from the fact that no feature of the State Board examinations in pharmacy is more prominent than the questions in this direction.

Lectures, textbook work and class exercises, two hours weekly through eighteen weeks.

**PHARMACY AND MANUFACTURING, 2.**—*Materials.*—Preparatory study of the materials used in the manufacture of pharmaceutical, chemical and industrial products.

This course is designed to impart to the student a sufficient degree of practical familiarity with the general character and properties of important classes of raw materials out of which he must later make finished preparations. Both inorganic and organic raw materials are discussed to the extent to which this may be profitably done in advance of the study of their chemistry to which this practical introduction to their physical properties is a most helpful preliminary.

The general physical properties and behavior of the most important classes of constituents of plants, such as cellulose, starch, pectin, mucilage, sugars, albumin, fixed oils, volatile oils, resins, tannin, amara, glucosides and alkaloids are reviewed sufficiently to render the practical study of their extraction or elimination, and the manufacture of preparation of plant substances, intelligent and effective.

About eighteen lectures and recitations. Laboratory work supplementing the lessons taught in these lectures is included in course 6.

**PHARMACY AND MANUFACTURING, 3.**—*Manipulations.*—A preparatory course of lectures and recitations on laboratory operations employed in making and purifying pharmaceutical, chemical and other industrial products. The course covers such processes as those of powdering, solution, filtration, evaporation, crystallization, distillation, precipitation, methods of extraction, including percolation, etc. Two hours weekly.

Laboratory practice is given in course 6.

PHARMACY AND MANUFACTURING, 4.—*Products*.—General review of pharmaceutical and other similar preparations. In this course the products studied are taken up in classes according to their general character and modes of preparation. Powders, triturations, masses, troches, tablets, pills, capsules. Cataplasms, ointments, cerates, plasters, suppositories, bougies. Solutions, waters, mucilage, syrups, glycerites, emulsions. Infusions, decoctions. Tinctures, wines, fluid extracts, and other liquid extracts. Solid extracts, oleresins, precipitated resins, etc.

Lectures and recitations two hours weekly through eighteen weeks.

PHARMACY AND MANUFACTURING, 5.—*Applied Inorganic Pharmaceutical and Manufacturing Chemistry*.—The principles specially governing the processes by which inorganic chemical products are made. The selection of materials and methods. Since the chemical products which are pharmaceutically important embrace not only the chemicals which are used in medicine alone but almost all the products which are industrially important this course covers practically all kinds of inorganic chemical preparations.

Lectures and recitations two hours weekly through eighteen weeks.

Supplemented by courses 6 and 7.

PHARMACY AND MANUFACTURING, 6.—*Preparatory Laboratory Course in the Study of the Materials and Operations of Manufacturing*.—Experimental work on the physical properties and behavior of the raw materials and constituents referred to in course 2. The separation of the constituents from the crude plant substances and from each other, and the manufacture of certain products in the preparation of which the general character of the materials may be most effectively studied.

The manipulations discussed in course 3 are exemplified by actual practice, and the work selected is such as will best familiarize the student with the apparatus employed, the most common materials operated upon, the methods and manipulations, and the simpler preparations. Thus a part of the work consists of examples of the purification of commercial chemicals by recrystallization and by other means. The inorganic substances operated upon include the most common metals, the common acids and alkalies, oxides, salts and other compounds, with which the student thus acquires a sufficiently extensive and living practical familiarity to greatly facilitate his grasp of the science of chemistry.

This course consists of fifty-four laboratory periods of three hours each through eighteen weeks.

PHARMACY AND MANUFACTURING, 7.—*Laboratory Practice in the Manufacture of Inorganic Chemical Preparations*.—A great variety of inorganic chemicals are manufactured by the students, including typical examples of nearly all classes of compounds. Particular attention is given to pharmaceutical and industrial chemicals of special importance or interest or affording especially instructive practice. Among the raw materials employed in the Manufacturing Laboratory are many minerals and other crude natural products in order that students may have practical experi-

ence in making finished chemical preparations out of the cheapest and most common materials that can be successfully used. Other and purer materials are, of course, also employed whenever requisite. Hundreds of specimens of the products manufactured by the students are exhibited at the School and are open to inspection by any one interested.

Fifty-four laboratory periods of three hours each extending through eighteen weeks.

PHARMACY AND MANUFACTURING, 8.—*Pharmacy of the Organic Drugs*.—The important manufactured preparations of individual plant drugs. The relation of the constituents of the drugs to the methods employed in the preparation of their extracts, liquid and solid, and other important products. A thorough discussion of the scientific principles governing the pharmacy of organic drugs and the preservation of their preparations.

Lectures and recitations two hours weekly through eighteen weeks.

PHARMACY AND MANUFACTURING, 9.—*Miscellaneous Preparations and Products*.—Unofficial pharmaceutical, medicinal, surgical, sanitary, dietetic and other articles usually supplied by pharmacists, including surgical dressings, antiseptics, toilet preparations, perfumery, flavoring extracts, etc.

About twelve lectures.

PHARMACY, 10.—*The Pharmacopœia of the United States and Pharmacopœias of Other Countries*.—Lectures and recitations on the character, scope and functions of pharmacopœias. A systematic study of the essential distinctive features of the text of the American Pharmacopœia.

How it is constructed.

The principles of construction of systematic pharmaceutical nomenclature and its relations to proper classification of the medicinal substances. The bearings of the nomenclature upon scientific pharmacy. Latinic and non-latinic titles. Non-systematic names. The latinity of the American pharmacopœial nomenclature.

Every American student of pharmacy should own and study the Pharmacopœia of the United States, and in the School of Pharmacy of Northwestern University that law-book for the pharmacist is studied in the class room, book in hand. Each student is expected to have the text before him at every recitation.

Comparative study of the pharmacopœias of the world, their scope, their style of construction, materia medica, chemistry, pharmacy, nomenclature, preparations, and other important features.

A course of about twelve lectures.

PHARMACY, 11.—*The Professional-Technical Duties and Responsibilities of Pharmacists*, including the relations of pharmacists to the medical profession and the community.

*The Prescription*; its construction and interpretation. The prescription table and its problems. Dispensing.

The demands of modern scientific medicine upon the pharmacist of this century.

Pharmacy laws, poison laws, etc.

A course of about twelve lectures.

PHARMACY, 12.—*Laboratory Course in Dispensing.*—It is now generally conceded that a systematic course of laboratory training in the art of making extemporaneous pharmaceutical preparations and in compounding and dispensing medicines must be a fundamental and crowning feature of any first-class school of Pharmacy. In the Dispensing Laboratory of the School of Pharmacy of Northwestern University (the first workshop of its kind) the student sees and learns to use an outfit of dispensing apparatus many times as extensive as can be found in many of the best drug stores together. Every student is required to make a great variety of extemporaneous preparations. The lessons are systematically prepared or selected with the view to include all important phases of work at the dispensing table with all kinds of materials and by all the different methods practiced. A practical experimental study of incompatibilities is included in this course.

Two laboratory periods of two hours each, weekly, through eighteen weeks.

BUSINESS TRAINING.—A course of class exercises and practice continuing through eighteen weeks, one hour weekly, designed to teach the student how the most common and essential commercial affairs connected with the drug business are conducted, including book-keeping. Students are taught the nature and uses of invoices, bills, statements, orders, receipts, the banking business of the druggist, bills receivable and payable, drafts, notes, checks; they learn something of the meaning and uses of price lists and discounts, credits, collections, remittances, consignments, taking stock, partnership, commission; insurance, interest, taxes; contracts, leases, bills of sale, etc.

This course is optional.

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Students taking the course for the degree of Graduate in Pharmacy may take all the courses required for the degree of Pharmaceutical Chemist upon payment of the nominal additional fee of five dollars per term of eighteen weeks, but are not eligible for graduation with the degree of Pharmaceutical Chemist unless they satisfy the requirements of the School as to preliminary general education.

If they take all of the work prescribed for the class taking the course leading to the degree of Pharmaceutical Chemist through the first, second and third terms, and complete all the courses for the degree of Graduate in Pharmacy during those three terms, they may receive the degree of Graduate in Pharmacy at the close of the third term and that of Pharmaceutical Chemist upon the satisfactory completion of all the additional courses required for that degree.

Attention is called to the fact that one or two of the courses can be taken in the Summer term if desired.

But no student will receive the degree of Graduate in Pharmacy except upon regular attendance during at least three terms of eighteen weeks each, and students receiving credits for work completed in other schools are required to attend this School one full school year (nine months) before they can become eligible for graduation.

## COURSES FOR THE DEGREE OF PHARMACEUTICAL CHEMIST.

All of the courses described in the foregoing pages, except Organic Chemistry, Course 2, which is replaced by Course 6. The following additional courses are required for the degree of Pharmaceutical Chemist:

INORGANIC AND ANALYTICAL CHEMISTRY, 5.—*Quantitative Analysis, chiefly Gravimetric.*—This course of laboratory practice in gravimetric methods of analysis includes twenty-seven laboratory periods of three hours each.

INORGANIC AND ANALYTICAL CHEMISTRY, 6.—*Urine Analysis*, qualitative and quantitative. The detection and determination of constituents of urine which are of importance in the diagnosis of disease.

Twenty-seven laboratory periods of three hours each.

BOTANY, MICROSCOPY AND PHARMACOGNOSY, 4.—*Commercial Microscopy.*—A course designed to afford the requisite training for the duties of the Pharmaceutical Chemist and Public Microscopist, including the examination of powdered drugs, spices, food-stuffs, etc. Specially prepared cross and longitudinal sections of whole specimens are supplied for comparison with the tissue elements as found in powders. A thorough study of the various kinds of starch is made. Hairs and textile fibers are studied. Training is given in microtechnique, including micrometry and work with the camera lucida and polariscope. Special methods for the isolation and determination of the structural elements of woods, stems, leaves, barks, roots, rhizomes, seeds, fruits, glands and spores.

The laboratory is amply supplied with appropriate reagents.

Six hours weekly through eighteen weeks.

ORGANIC CHEMISTRY, 3.—*Organic Chemical Operations.*—Laboratory instruction in organic chemistry, including the processes of testing organic compounds for the detection of impurities and adulterations; practical study of methods of taking melting points and boiling points; identification and examination of modern organic compounds such as the so-called synthetics; quantitative estimations of certain organic substances such as formic aldehyde, etc. The production of a variety of ethers and other organic compounds, including several of the newer remedies such as acetanilide, etc.

Twenty-seven laboratory periods of three hours each.

ORGANIC CHEMISTRY, 4.—*Special Course on Alkaloids, Glucosides, etc.*—A course of about eighteen lectures upon the alkaloids, glucosides and other definite chemical compounds contained in drugs and other plant substances. Their composition, separation, identification, properties and relationships.

ORGANIC CHEMISTRY, 5.—*Food and Sanitary Analysis.*—The examination of water to determine its potableness and fitness for household uses, and the examination of milk, butter, cheese, beverages, and food products generally, and such other work as is usually required of public analysts for sanitary purposes.

Nine hours laboratory work weekly through eighteen weeks.

ORGANIC CHEMISTRY, 6.—*Drug Assaying.* Practice in the separation, identification and estimation of alkaloids. Valuation of

drugs and preparations, and related products. Fifty-four laboratory periods of three hours each.

PHARMACY AND MANUFACTURING, 13.—*Laboratory Practice in the Production of Miscellaneous Organic and Inorganic Pharmaceutical and Industrial Products.*—Advanced work in the Manufacturing Laboratory.

About thirty-four laboratory periods of three hours each, extending through eighteen weeks.

BACTERIOLOGY.—Lectures one hour weekly and laboratory work nine hours weekly through nine weeks. The most approved methods are taught.

Bacteria in health and disease. Culture Media. Culture Methods. Staining. Identification of some of the more common bacteria of earth, air and water. Toxins and antitoxins.

Non-pathogenic germs are first used for purposes of instruction. The common disease producing bacteria are then studied.

The course is a practical one, enabling the student to fit himself to do successfully the bacteriological work ordinarily required for medical diagnosis and for sanitary purposes.

Students taking the courses for the degree of Pharmaceutical Chemist are offered also the additional courses given to special students taking the program of work arranged for analytical chemists and microscopists. These additional courses may be completed in one term of eighteen weeks.

Students who have had two full years of college work exclusive of chemistry, may upon completion of the courses for the degree of Pharmaceutical Chemist receive also the degree of *Bachelor of Science*.

The degree of *Master of Pharmacy* is conferred upon students who have completed all the courses required for the degree of Pharmaceutical Chemist and in addition three full years of college work.

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## PROGRAM OF SPECIAL COURSES OF TRAINING IN CHEMISTRY AND MICROSCOPY.

Special courses of training are offered to those who do not intend to practice pharmacy, but who wish to prepare themselves for the occupation of general, sanitary and commercial analytical chemists and microscopists and for work in chemical and pharmaceutical manufacturing laboratories. The program of work arranged for this purpose is designed to prepare the student for the duties to be performed by chemists and microscopists under the food and drug laws, as well as for other work usually performed by public analysts or commercial chemists, and it includes also mineralogy and mineral assaying. The courses included in this program are as follows:

INORGANIC AND ANALYTICAL CHEMISTRY, Courses 1, 2, 3A and 3B, and 4, described on pages 10 and 11; Course 5, described on p. 16, and Course 7, described below.

BOTANY, MICROSCOPY AND PHARMACOGNOSY, Courses 1, 2A and 2B, and 3, described on page 11, and Course 4, described on page 16.

ORGANIC CHEMISTRY, Course 1., described on page 12, and Courses 3, 4, 5 and 6, described on page 17.

PHARMACY AND MANUFACTURING, Courses 1, 2, 3, 4, 5, 6, 7 and 8, described on pages 12 to 14.

MINERALOGY, BLOWPIPE ANALYSIS AND MINERAL ASSAYING, described below.

These courses have been described in the foregoing pages except the following:

INORGANIC AND ANALYTICAL CHEMISTRY, 7.—*Advanced Quantitative Analysis*.—An extension of courses 4 and 5, leading to the analysis of materials of technical and industrial importance. Iron ores, iron and steel, slags, cements and cement materials, alloys; and the wet assay of ores of copper, lead, zinc, etc.

Fifty-four laboratory periods of three hours each, extending through eighteen weeks.

MINERALOGY AND BLOWPIPE ANALYSIS.—Lectures and laboratory work six hours weekly through eighteen weeks.

MINERAL ASSAYING.—Lectures and laboratory work seven hours weekly through eighteen weeks.

Certificates in due form will be given upon satisfactory completion of these courses. Students who have in addition completed two full years of college work exclusive of chemistry may receive the degree of *Bachelor of Science*.

Students taking this program of work are also offered the courses in Urine Analysis (p. 16) and Bacteriology (p. 17), the courses in Human Anatomy and Physiology (p. 12), *Materia Medica* and Therapeutics (p. 12), and courses 9, 10, 11, 12 and 13 in Pharmacy (described on pages 15 and 17), upon completion of which they may receive the degree of Pharmaceutical Chemist.

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### A FIVE SEMESTERS COURSE

is offered, which includes all of the work required for the degree of Pharmaceutical Chemist and all of the work embraced in the special program of training for Chemists and Microscopists, together with—

ORGANIC CHEMISTRY, Course 7.—*More Advanced Work in Organic Analysis*.—Water Analysis. The examination of oils, fats, waxes, soaps and other industrial materials and products.

Three laboratory periods, of three hours each, through one semester of eighteen weeks.

FACULTY OF THE SCHOOL OF PHARMACY OF  
NORTHWESTERN UNIVERSITY.

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- EDMUND JANES JAMES, PH. D., LL. D., *President of the University.*
- OSCAR OLDBERG, PHARM. D., DEAN, *Professor of Pharmacy and Director of the Pharmaceutical Laboratories.*
- WILLIAM EDWARD QUINE, M. D., *Emeritus Professor of Physiology, Therapeutics and Toxicology.*
- ALJAH ROBINSON CROOK, PH. D., (Univ. of Munich, Bavaria), *Professor of Mineralogy and Mineral Assaying.*
- HARRY MANN GORDIN, PH. D. (Univ. of Berne, Switzerland), *Professor of Organic Chemistry and Director of the Organic Chemical Laboratory.*
- THEODORE WHITTELSEY, PH. D. (Univ. of Göttingen, Germany), *Professor of Inorganic and Analytical Chemistry, and Director of the Inorganic Chemical Laboratories.*
- RAYMOND H. POND, PH. D. (Univ. of Michigan), *Professor of Botany, Microscopy, Pharmacognosy and Bacteriology, and Director of the Microscopical and Bacteriological Laboratories.*
- MAURICE ASHBEL MINER, PHARM. M. (Univ. of Michigan), *Assistant Professor of Pharmacy, in charge of the Manufacturing Laboratory. Curator.*
- CHARLES WAGGENER PATTERSON, SC. B., PH. C. (Northwestern University), *Assistant Professor of Organic Analytical Pharmaceutical Chemistry, in charge of the Organic Chemical Laboratory. Registrar.*
- HARRY KAHN, PHARM. M. (Univ. of Michigan), M. D. (Northwestern), *Assistant Professor of Physiology and Materia Medica.*
- DAVID CHARLES ECCLES, SC. B., A. M. (Columbia University), *Instructor in Pharmacy, in charge of the Dispensing Laboratory. Secretary of the Faculty.*
- GUSTAVE E. F. LUNDELL, SC. B. (Cornell University), *Instructor in the Inorganic Chemical Laboratories.*
- GERHARD H. JENSEN, SC. B. (Cornell University), *Instructor in Botany and Pharmacognosy.*
- JOHN FERD. FISCHNAR, PH. C. (Northwestern), *Assistant in the Pharmaceutical Laboratory.*
- LEONARD A. JOHNSON, PH. C. (Northwestern), *Assistant in the Chemical Laboratory.*
- ERNEST WOOLLETT, *Stenographer and Librarian. Instructor in Bookkeeping and Business Methods.*

# **Announcement.**

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## **THE SCHOOL OF PHARMACY OF NORTHWESTERN UNIVERSITY.**

Northwestern University Building, Chicago.

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This is the largest university school of pharmacy in America.

It has also the most extensive equipment and the largest staff of teachers devoting their whole attention to students of pharmacy and chemistry.

The courses are thorough and practical and in accord with the highest standards attained in pharmaceutical education in this country.

Laboratory training, which is the most important feature of sound modern education for the practical work of pharmacy, is amply provided for in the workshops of this school.

Northwestern University School of Pharmacy was the first American college of its kind to introduce laboratory training in the study of drugs, laboratory courses in microscopy and pharmacognosy having been obligatory in this institution from the beginning of its career in 1886.

The Dispensing Laboratory of this school, established in 1886, was the first of its kind in the history of pharmaceutical education, and is the largest and most completely appointed training shop for practical instruction in the most important work the pharmacist has to do—the special work of preparing medicines in accordance with the prescriptions of physicians. The students of this school see and do a greater variety of dispensing work than it is possible to find in several years' experience in any pharmacy, because the lessons prepared for purposes of instruction and practice are selected and arranged with the view to include all technical problems likely to be met with in the actual practice of the largest and busiest establishments.

The classes of this school are drawn from all parts of the country, about twenty-five different states being represented in the annual attendance.

One thousand five hundred alumni of this school have gone forth since 1886.

In its new home Northwestern University Building, on the southeast corner of Lake and Dearborn streets, this school occupies the entire fourth floor and an additional laboratory room on the first floor, and has more ample and convenient facilities than ever before. The building is 160 by 180 feet. It is provided with steam heat, electric lights and electric elevators. Twenty-four rooms are assigned for the exclusive use of the School of Pharmacy. An adequate conception of the size of this plant may be formed from the fact that over three hundred students can at any time be conveniently at work in the laboratories, each student at his own individual desk.

The location of the school in the center of this great metropolis of the new world assures to its students in fullest measure the educational opportunities which residence in such a city always affords. The school is conveniently accessible to the thousand drug stores of Chicago and its suburbs, it is near the wholesale drug houses and the business places of the dealers in chemical apparatus and supplies and all the principal stores. Chicago is one of the greatest centers of commerce, manufacture, education, art, and every form of useful human activity, and life in it, under the safeguards which university membership provides, may be made a potent factor in the development of character and strength.

The splendid public libraries of this city are within easy reach of Northwestern University Building.

## OCCUPATIONS OPEN TO GRADUATES OF THE SCHOOL OF PHARMACY OF NORTHWEST- ERN UNIVERSITY.

Various occupations are more or less related to pharmacy in that they require in great part the same courses of preparatory training that are necessary to thorough pharmaceutical education. The courses given in the School of Pharmacy of Northwestern University open up to its students quite a number of occupations in which they can readily make

practical use of their training. These occupations are very important ones, too. They are:

The Retail Drug Business as generally conducted.

Purely Professional-technical Pharmacy—not combined with any general merchandising.

The Wholesale Drug Trade.

The Trade in Chemical Apparatus and Supplies.

Pharmaceutical Manufacturing Laboratories.

Chemical Manufacturing Laboratories.

Establishments for the Manufacture of Industrial Chemical Products of all kinds.

Positions as Pharmacists in the Army, the Navy and the Marine-Hospital Service of the United States.

Analytical Chemistry and Microscopy in such lines of work as Commercial and Sanitary Public Analysts are called upon to do.

Mining Chemistry.

Graduates of this school are to be found in all the occupations mentioned.

The materials and products handled by persons engaged in these pursuits are to a very large extent the same, and a well grounded knowledge of their character and properties can be attained only by special courses of study and laboratory work.

The groundwork of the training of a general chemist, a manufacturer of chemical or of medicinal products, a pharmacist, a perfume maker, a manufacturer of varnishes, an analytical chemist, is necessarily the same.

Pharmacists have at all times more frequently than any other technical workers successfully undertaken miscellaneous related pursuits. They have become makers of alkaloids and related plant products; chemicals; medicinal preparations; sanitary and toilet preparations; perfumery; soaps; baking powders and flavoring extracts; paints; colors; pepsin and pancreatin and other digestive ferments; varnishes and polishes; and numerous other products of technological chemistry and chemical engineering. They have also become analytical chemists, performing such chemical and microscopical examinations as physicians require for purposes of diagnosis. They have been toxicological chemists.

In the immediate future pharmacists will necessarily be required to possess such thorough training in chemical analysis that they can be depended upon to do the vast amount

of work which will be demanded by the food and drug laws and by the health authorities.

Fifteen of the alumni of this school are now teachers in medical and pharmaceutical schools of this country.

### COURSES AND DEGREES.

Three distinct degrees in pharmacy are conferred by Northwestern University. These are the degrees of Graduate in Pharmacy, Pharmaceutical Chemist and Master of Pharmacy.

*The Course for the Degree of Graduate in Pharmacy*, as now given in this school, embraces fifty-four weeks of college work. This whole period of fifty-four weeks is divided into three equal parts—three terms of eighteen weeks each. Students taking this course may take two terms' work the first year and one term's work the second year, or *vice versa*, according to circumstances.

The subjects studied are Inorganic Chemistry; General Pharmacy; the Materials, Operations and Products of Manufacturing Pharmacy and Chemistry; Weights and Measures and Pharmaceutical Arithmetic; Pharmaceutical Botany, Microscopy and Pharmacognosy; Physiology and Materia Medica; Pharmacopœias; Pharmaceutical and Chemical Nomenclature; the study of important individual Pharmaceutical Preparations; discussion of all the classes of unofficial preparations and products commonly supplied by pharmacists; the Art of Dispensing; Business Training for the Druggist; Organic Chemistry; the Pharmacy Laws; the duties and responsibilities of pharmacists and their relations to the medical profession and the community.

The laboratory courses for the degree of Graduate in Pharmacy cover Elementary Experimental General Chemistry; Qualitative Analysis and the Tests prescribed by the Pharmacopœia; the production of Pharmaceutical and Chemical Preparations, official and unofficial; Volumetric Analysis; Pharmaceutical Botany and Microscopy; Pharmacognosy; Drug Assaying and the Valuation of Preparations, Pepsin, Malt Extract, etc.; and Dispensing.

The laboratory work aggregates about 1,000 hours in the whole course of fifty-four weeks.

*The Course for the Degree of Pharmaceutical Chemist* occupies four terms of eighteen weeks each, or two school

years of nine months each. It embraces all the work included in the course for the degree of Graduate in Pharmacy, and, in addition, further study of Organic Pharmaceutical Chemistry and other subjects.

The additional laboratory courses are in Quantitative Analysis, Organic Chemical Preparations and Operations, Commercial Microscopy, Drug Assaying, Food Analysis, Commercial Organic Analysis, Urine Analysis and Bacteriology.

The laboratory work in this course amounts to about 1,700 hours, extending through about seventy-two weeks.

*Course for the Degree of Master of Pharmacy.* This course includes all the work of the other two degrees, following three years of full work in the College of Liberal Arts of the University. If in these three years all the courses prescribed for the bachelor's degree are satisfactorily completed and a total of one hundred semester hours of credit are secured, the degree of *Bachelor of Science* may be obtained upon the completion of the first year in the Pharmacy course and the Master's degree in pharmacy at the close of the second year.

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A special program of training is offered to students who do not intend to practice pharmacy but who desire to prepare themselves for the occupation of

GENERAL, COMMERCIAL AND SANITARY ANALYTICAL CHEMISTS  
AND MICROSCOPISTS.

This program is as follows:

General and Inorganic Chemistry, theoretical and descriptive, with laboratory work in general chemistry; qualitative analysis; quantitative analysis, elementary and advanced, including industrial inorganic analysis.

Organic Chemistry, general and special, with laboratory work in organic chemical preparations and operations; pharmaceutical, sanitary and commercial organic analysis.

Manufacturing. Study of materials, processes, apparatus, manipulations, general principles and products. Inorganic and organic work. Pharmaceutical, chemical and miscellaneous technological work.

Botany, Microscopy and Pharmacognosy (including the "Waarenkunde" of the vegetable kingdom). Drugs, food stuffs, spices, dye stuffs, hairs and fibers, powders, etc. Commercial microscopy.

Mineralogy, Blowpipe Analysis and Mineral Assaying.

The total of laboratory work in this course amounts to about 1,700 hours, extending through seventy-two weeks, or two annual sessions of nine months each.

### DATES OF ADMISSION.

The School of Pharmacy of Northwestern University is in active operation nearly eleven months in each year. That time is divided into two terms of eighteen weeks each and one term of seven weeks.

The *Fall Term* begins in the second week of September and ends at the beginning of February.

The *Spring Term* begins in the first week of February and ends about the middle of June.

Students taking the regular courses offered may enter at the beginning of either the Fall Term or the Spring Term. All the courses of study and laboratory work given in the school are given both in the Fall Term and in the Spring Term so that all students, whether they enter in the second week of September or the first week of February, take all of their work in the same way and in the same sequence.

THREE TERMS OF EIGHTEEN WEEKS EACH CONSTITUTE THE COURSE FOR THE DEGREE OF GRADUATE IN PHARMACY.

FOUR TERMS OF EIGHTEEN WEEKS EACH CONSTITUTE THE COURSE FOR THE DEGREE OF PHARMACEUTICAL CHEMIST, and

FOUR TERMS OF EIGHTEEN WEEKS EACH ARE ALSO REQUIRED FOR THE COMPLETION OF THE COURSE OF TRAINING OFFERED TO students desiring to prepare themselves for the occupation of general and analytical CHEMISTS AND MICROSCOPISTS.

### THE SUMMER SCHOOL.

The *Summer Term* begins on the Monday immediately preceding the Annual Commencement of the University, on the third Thursday of June.

The courses given in the Summer Term are arranged for the convenience and benefit of students who wish to take additional work, or to review or repeat one or two individual courses, or to distribute their work over an additional period in order to be enabled thereby to hold positions whereby they may earn part of their expenses, and for special stu-

dents, graduates and non-graduates, who desire to take some one or two of the special courses given in this school.

The laboratory courses given in the Summer Term are such as can be satisfactorily completed in seven weeks with twelve or twenty-four hours' work weekly. Two or three such courses can accordingly be carried together.

Among the courses which may be taken in the summer school are those in: *Pharmaceutical Preparations*, from 12 to 24 hours weekly; *Dispensing*, 12 hours weekly; *Qualitative Analysis*, 12 or 24 hours weekly; *Quantitative Analysis*, 12 or 24 hours weekly; *Urine Analysis*, 12 hours weekly; *Plant Histology*, 12 hours weekly; *Pharmacognosy*, 12 hours weekly; *Drug Assaying*, 12 to 24 hours weekly; *Commercial Microscopy*, 15 hours weekly; *Food Analysis*, 15 to 24 hours weekly; and *Bacteriology*, 12 hours weekly.

Pharmacists, physicians, chemists, teachers and others may avail themselves of these summer courses.

### ADMISSION REQUIREMENTS.

All matriculants for the degree of *Graduate in Pharmacy* must possess a general education at least equivalent to that required for admission to a high school of the best grade.

Persons who have, *upon examination*, been registered by Boards of Pharmacy as pharmacists, assistants or apprentices, are admitted upon presentation of their certificates.

Matriculants for the degree of *Pharmaceutical Chemist* must possess a general education at least equivalent to that required for graduation from a high school of the best grade.

Matriculants for the degree of *Master of Pharmacy* must satisfy the requirements for admission to the College of Liberal Arts of this University, or prove an equivalent educational preparation approved by the Faculty of that college, and must have satisfactorily completed three years of full work in said college, or its satisfactory equivalent in some other recognized college. The subjects taken at the College of Liberal Arts may be selected from English, German, Latin, Mathematics, French, Physics, Chemistry, Botany and Zoölogy.

Students in the course for the degree of Master of Pharmacy take the courses for the degree of Pharmaceutical Chemist modified and enlarged to correspond with their preparatory college work, and their studies at the School of Pharmacy occupy eighteen months. Upon satisfactory comple-

tion of the first year's work in the School of Pharmacy they may receive the degree of *Bachelor of Science*, and upon finishing the whole two years' course they receive the degree of Master of Pharmacy.

### GENERAL REQUIREMENTS.

The conditions of promotion and graduation include: Satisfactory deportment, due observance of the rules of the school, regular attendance during the full periods prescribed, satisfactory completion of the required work, good standing in the recitations and examinations throughout the courses, diligence and success in the laboratory work, payment in full of all dues, and the settlement of all accounts.

### CREDITS.

Any student presenting proper evidence of having satisfactorily completed in any other good school any one or more of the courses of study or laboratory work included in the curriculum of this school may, if desired, receive such credit therefor as may be consistent with the prescribed requirements.

Students of pharmacy who have completed the first year's work, or any part of the course, in any other reputable institution, may receive due credit therefor upon presentation of satisfactory credentials.

### EXPENSES AND DEPOSITS.

The *matriculation fee*, payable only once and before registration, is \$5. It is not returnable.

The *tuition fee*, including drugs and chemicals consumed in the laboratory work, is \$60 for each term of eighteen weeks in the course for the degree of *Graduate in Pharmacy*.

Students registered in the course for that degree may upon payment of the additional sum of \$5 receive all the additional instruction given to students registered in the course for the degree of *Pharmaceutical Chemist*.

The *tuition fee* payable for the course leading to the degree of *Pharmaceutical Chemist* is \$65 for each term of eighteen weeks, including drugs and chemicals consumed in the laboratory work.

The *tuition fee* for the special program of instruction and laboratory work arranged for the training of *chemists*

*and microscopists* is the same as for students registered in the course for the degree of Pharmaceutical Chemist.

Students desiring to take all of the work for the degree of Pharmaceutical Chemist and also all of the work included in the curriculum for chemists and microscopists may do so upon payment of the regular tuition fee for one additional term of eighteen weeks and can complete all the courses in five terms.

The tuition fee for individual laboratory courses, taken separately, whether taken in the summer terms or at other times, is about \$10 for each course of about eighty to eighty-four hours, or \$20 for a course of twice that amount of work. This fee includes drugs, chemicals and other laboratory materials consumed.

Students taking partial, divided or special courses, including those who are employed in drug stores, are required to pay tuition fees corresponding to the amount of school work taken by them.

A charge is made of two dollars per term for the use of microscopes, balances and other apparatus, and for their maintenance and replacement.

To cover the cost of apparatus lost, destroyed or damaged, and any damage willfully or needlessly inflicted to building, furniture or other property, each student is required to make a deposit of \$5 before being assigned tables in the laboratories. This deposit is intended to cover the whole term and is in most cases sufficient for that purpose. But students who may damage or destroy apparatus or other college property to the value of more than the amount of their deposits will be required to make good the damage in addition. Deductions will be made from the deposit to cover the cost of avoidable loss or breakage and articles not returned.

Each student is charged for any damage or loss for which he is individually responsible and for his *pro rata* share of damage or loss the responsibility for which can not be individually located. The remainder of his deposit is returned to each student at the end of the term or whenever he discontinues his attendance at the school.

Text-books, note-books, laboratory aprons, towels, filter paper and any other articles not included in the outfits of apparatus, or not returnable, are furnished to the students at cost. But any student may purchase these books and articles wherever he sees fit.

Certain indispensable articles (not materials consumed) are necessarily furnished by the school for the convenience of students and to render the work effective and orderly. These articles include, for example, note-books, drawing-books, dissecting needles for use in the microscopical laboratory, aprons and sleeves, additional pieces of apparatus required to replace those broken or lost, etc. For this purpose each student is required to obtain a coupon ticket to the amount of \$5. Supplies of this kind are issued in no other way. Unused coupons are redeemed at the end of the year or whenever the student discontinues his attendance.

The diploma fee, payable not later than two weeks before graduation, is \$10.

The total cost of text-books for the entire course from the beginning of the Junior to the end of the Senior year, amounts to about thirty dollars. About one-third of these books are required immediately upon entering for the first term, and the remainder may be procured from time to time as the courses progress.

Printed lists of these books with prices are furnished at the office of the school.

Individual lockers are rented to students at \$1 each. That rental covers the whole period of the student's uninterrupted attendance, whether that be one or two terms.

## THE LABORATORIES.

The school has seven laboratories.

1. The Manufacturing Laboratory, for practice in the production of chemicals and pharmaceutical preparations.

2. The General Chemical Laboratory, for the courses in qualitative inorganic analytical chemistry.

3. The Quantitative Inorganic Chemical Laboratory.

4. The Laboratory for Botany and Pharmacography, for the study of vegetable drugs and powders.

5. The Laboratory for Organic Analytical Chemistry, for instruction and practice in drug assaying, the identification and estimation of alkaloids, examination of pharmaceutical preparations, food analysis, sanitary analysis of water and other related work.

6. The Dispensing Laboratory for instruction and practice in the operations of compounding and dispensing medicines.

7. The Bacteriological Laboratory for practice in the technique of bacteriology.

Urine analysis is also provided for.

The courses in mineralogy, blowpipe analysis and mineral assaying are given in the laboratories of the Science Building of the University.

The furniture, fixtures, apparatus, instruments and all other appointments in these laboratories are new and complete, and it is believed that the equipment as a whole is superior to anything now existing in any other pharmaceutical college.

### THE LIBRARY.

The Library of the School of Pharmacy of Northwestern University contains the principal current chemical and pharmaceutical journals of the world, which are received as soon as published. It has complete sets of the *Archiv der Pharmacie*, *Proceedings of the American Pharmaceutical Association*, *British Pharmaceutical Journal*, and, since 1891, of the "Berichte" of the German Chemical and Pharmaceutical Societies, the "Chemisches Centralblatt," etc. The pharmacopœias of all countries and all important commentaries upon them are contained in the library, and all the most valuable reference works in chemistry, pharmacy, botany, pharmacognosy, physics, and related subjects, together with cyclopedias, dictionaries, formularies and other works necessary to students of pharmacy and of applied chemistry.

This library is open to all students at specified hours and the current journals are accessible to them at all times.

### THE MUSEUM.

The Museum contains several thousand plant drugs and related products, including many exceptionally valuable specimens exhibited at the World's Columbian Exposition in Chicago by the governments of Central and South American countries.

Extensive and valuable collections of chemicals and other preparations are also possessed by this school, including a great number of excellent products made in the laboratories by its students.

Students will have abundant opportunities to see and handle the most common and important drugs, chemicals, preparations and apparatus, that they may learn their appearance, names and uses, the object being to aid every stu-

dent in acquiring as early in the course as practicable that degree of familiarity with these things which a pharmacist's apprentice may gain in the first year or two of his employment if he is fortunate enough to enjoy the help of a good preceptor.

## THE FACULTY.

Ten teachers and two assistants constitute the staff of this school. Eight of them have had several years' practical experience in pharmacy.

All the teachers, with but one exception, give their whole time to the School of Pharmacy.

Having no other students but the students of pharmacy, and giving their whole time and attention to these, the teachers are unhampered in their efforts to adapt all of their work, in the best way, to the special demands of scientific pharmacy, and the students receive a greater measure of individual attention.

## METHODS OF INSTRUCTION.

The courses of instruction are graded or progressive and as comprehensive as is consistent with thoroughness.

The methods of instruction include lectures, recitations and laboratory practice.

The lectures are illustrated by experiments, charts, apparatus, specimens, etc., as occasion requires.

Each student is assured as large a share as practicable of the individual attention of the teachers, and it is sought to make his work interesting as well as instructive, to cultivate his desire for knowledge and to teach correct methods for its acquisition.

All students are held to their appointed hours of school work and to the necessary text-book study.

Class exercises are conducted for the purpose of affording adequate practice in the solution of pharmaceutical problems, the use of technical nomenclature, the study of prescriptions and the recognition of drugs and preparations.

Laboratory work, which, in this school, occupies about two-thirds of the instruction hours, is a highly important feature of the courses, and at the same time constitutes the most profitable recreation the student can have.

## AMOUNT OF WORK.

Students taking the course for the degree of graduate in pharmacy are in attendance five days weekly, if they devote their whole time to their school work (that is, if they are not concurrently employed in drug stores or in other work not connected with the college courses); but students concurrently employed in drug stores may attend twenty hours weekly, or a greater or less number of hours, according to the time at their disposal and the studies carried by them.

Students who can give their undivided time to their college courses (in other words, those who are not obliged to earn their personal expenses by employment during their college attendance) are strongly advised *not* to devote any portion of their time to any kind of outside employment. A substantial course, such as is given in this school, can not be successfully completed in fifty-four weeks without undivided attention, and the amount of work required of full-time students is by no means greater than it should be to advantageously occupy their whole time.

On the other hand, students employed in drug stores should not attempt to do the weekly work of full-time students, but should divide their studies so that the work done will bear a proper proportion to the weekly school hours. In this school special arrangements are made to enable students to accept or retain outside employment (in drug stores or elsewhere) occupying a part of their time, so that they may carry as much of the school work as their time and ability permit. *The laboratory work alone* occupies, in this school, three days weekly for all students who finish their course in fifty-four weeks.

But students who correspondingly extend their college attendance accomplish all that is done by the full-time students, and the time card in this school has been made as convenient as possible. Clerks in the drug stores can come to the college in its new central location from any part of the city for one street car fare, and at noon they have time to visit wholesale drug stores for their employers if required.

Students employed in drug stores or engaged in other outside work during their college course may complete their work for the degree of Graduate in Pharmacy in four or five terms, according to the time at their command.

Such students may further equalize their school work throughout their whole course by making use of the summer terms for some of their work, being thereby enabled to make favorable arrangements with their employers for uninterrupted engagements.

### SEPARATE COURSES IN ANY DEPARTMENT.

Any student may take any one or more of the separate courses given in this school in Pharmacy, Botany, Inorganic Chemistry, Qualitative Analysis, Quantitative Analysis, Organic Analysis, Pharmacography, Dispensing, Urine Analysis, Bacteriology, or other subjects, at his option, and will receive full credit for all such work when satisfactorily done. This applies both to the didactic courses and to the laboratory work. But no student will be received into the school for a less period than one term.

### COURSES IN PHARMACY PRELIMINARY TO THE STUDY OF MEDICINE.

A large and increasing number of students intending to enter the medical profession take the courses in pharmacy in this school before beginning the study of medicine in order to lay a substantial foundation for their future work. A thorough, practical familiarity with drugs and medicines, and with their pharmacy, is invaluable to the practicing physician.

### EMPLOYMENT FOR STUDENTS.

Students who desire partial employment in drug stores during their college attendance to enable them to earn their expenses should send for the special circular relating to such employment.

Young men who have had sufficient drug store experience can easily find engagements.

A register is kept at the office of the school of students desiring positions and of employers desiring clerks, and special efforts will be made to provide satisfactorily for both.

### WOMEN IN PHARMACY.

Among the several occupations open to women pharmacy is peculiarly suitable, because it calls for just such qualifications as are naturally possessed by them, and because there

is nothing properly belonging to the pharmacy that women may not accomplish quite as easily and perfectly as men. Care, precision, delicacy, deftness, scrupulous neatness, sobriety and faithful attention to details are absolutely essential to good and correct results in all pharmaceutical and chemical work.

Women being admitted to the classes, this school has a separate study and dressing room for their exclusive use.

### EARLY ENROLLMENT.

All the students intending to enter the college will find it a great advantage to write early for information and matriculate in good season.

There is always more or less rivalry among the students of all professional technical schools in the selection of lecture-room seats and laboratory tables. In this school, where the classes are very large and where each student is assigned an individual desk in each of the several laboratories throughout his college attendance, it has been found necessary to adopt the rule that all students shall be entitled to their turn in the order in which they are enrolled, according to the dates of payment of fees. No student is allowed to select his lecture-room seat or laboratory desk until the whole class comes together at the beginning of the school session. The names of all of them are then called in the order in which they have secured their enrollment by the payment of \$5 (which is credited to them as a matriculation fee if new students, or on account of their laboratory deposit if already matriculates of this school), and each student is privileged to make his own choice.

### BOARD AND ROOM.

Very good board and room together can be secured near the school at from \$4 to \$6 per week. Students may also secure rooms and board separately. Information in regard to these matters and addresses of reliable and satisfactory private boarding places and furnished rooms will be supplied at the college. Good accommodations are plentiful, and satisfactory arrangements can be quickly made by each student immediately upon his arrival. It is wholly unnecessary and rarely advantageous to secure board and room in advance.

## THE YOUNG MEN'S CHRISTIAN ASSOCIATION.

The Young Men's Christian Association of Chicago has established a branch, which carries on work in the three schools located in Northwestern University building. In addition to its religious work, the association is of service to the students in many ways. In the pleasant rooms placed at its disposal by the University, the association maintains a very popular social center with a well-selected list of reading material, several games and a piano. Throughout the year a list of rooms and boarding places is kept for the use of students when they are getting located.

All students are invited to make the association rooms their headquarters during the year. As far as possible new students will be met at the train by an association man wearing a badge. Those desiring to be so met will please write a few days in advance to Mr. Paul C. Foster, care Y. M. C. A., Northwestern University building, Chicago, indicating clearly on which train they are to reach Chicago and over what road they are to come.

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**For further information address the Dean of the School of Pharmacy, Northwestern University Building, 87 Lake Street, Chicago, Ill.**

UNIVERSITY OF ILLINOIS  
SCHOOL CALENDAR FOR 1904-1905.

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1904.

PRESIDENT'S OFFICE.

September 12 and 13 (Monday and Tuesday)—Registration of Students for the Fall Term.

September 14 (Wednesday)—Laboratories Opened. Instruction Begins.

December 22 (Thursday)—Christmas Recess Begins.

1905.

January 3 (Tuesday)—Instruction Resumed.

February 1 (Wednesday)—Fall Term Ends.

February 3 and 4 (Friday and Saturday)—Registration of Students for the Spring Term.

February 6 (Monday)—Spring Term Begins.

June 12 (Monday)—Summer Term Begins.

June 14 (Wednesday)—Spring Term Ends.

June 15 (Thursday)—Annual Commencement of the University.

July 29 (Saturday)—Summer Term Ends.

September 11 and 12 (Monday and Tuesday)—Registration of Students for the Fall Term.

September 13 (Wednesday)—Laboratories Opened. Instruction Begins.

December 21 (Thursday)—Christmas Recess Begins.

1906.

January 3 (Wednesday)—Instruction Resumed.

## IMPORTANT NOTICE.

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The course for the degree of Graduate in Pharmacy as given in this school requires fifty-four weeks' college attendance. This period, instead of being divided into two or four equal parts, is divided into three equal parts or terms. Students may begin the course either in September or February, and may attend two terms the first year and one term the second year, or they may take one term the first year and two the second, or they may take one term's work each year, as may be most convenient to them.

The course for the degree of Pharmaceutical Chemist extends through four terms of eighteen weeks each, or two years of nine months each.

The special course for chemists and microscopists also extends through four terms of eighteen weeks each or two years of nine months each.

### THE SUMMER SCHOOL

is open for seven weeks of full work, beginning on Monday following the second Thursday in June. For information concerning the courses given in the summer term see pages 26 and 27.

NEXT FALL TERM BEGINS SEPTEMBER 12, 1904.

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THIS BULLETIN IS PUBLISHED QUARTERLY BY  
THE SCHOOL OF PHARMACY OF NORTH-  
WESTERN UNIVERSITY, CHICAGO.

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MARCH, 1905

No. 4

BULLETIN

OF

The School of  
Pharmacy

OF

NORTHWESTERN UNIVERSITY

THE TWENTIETH YEAR BEGINS SEPTEMBER 19th, 1905

NORTHWESTERN UNIVERSITY BUILDING  
Corner Lake and Dearborn Street - - Chicago

Entered June 24, 1902, at Chicago, Illinois, as Second-Class Matter, under  
Act of Congress of July 16, 1894.

# NORTHWESTERN UNIVERSITY

## *Evanston—Chicago*

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The University comprises the following departments of instruction, each having a distinct Faculty:

THE COLLEGE OF LIBERAL ARTS, in Evanston,  
*Founded in 1851, opened in 1855.*

THE MEDICAL SCHOOL, in Chicago,  
*Founded in 1859.*

THE LAW SCHOOL, in Chicago,  
*Founded in 1859.*

THE SCHOOL OF PHARMACY, in Chicago,  
*Founded in 1886.*

THE DENTAL SCHOOL, in Chicago,  
*Founded 1887.*

THE SCHOOL OF MUSIC, in Evanston,  
*Organized in 1895.*

The following non-degree conferring departments are maintained by the University:

THE ACADEMY, at Evanston,  
*Established in 1860.*

GRAND PRAIRIE SEMINARY, at Onarga, Illinois,  
*Founded in 1863.*

THE ELGIN ACADEMY, at Elgin, Illinois,  
*Chartered in 1839, opened in 1856.*

Garrett Biblical Institute, a theological school authorized by its charter to confer degrees in divinity, is established on its own foundation and under separate management. The buildings of the Institute are on the University campus in Evanston, and the school is in close co-operation with the University.

The Norwegian Danish Theological School in Evanston is affiliated with the Institute.

The Swedish Theological Seminary is an independent school located on the University Campus in Evanston.

The Cumnock School of Oratory is conducted on the University Campus in Evanston.

The Interstate School of Correspondence in Chicago is affiliated with the University, its certificates in academic courses being accepted at their face value toward meeting the entrance requirements in any department.

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## SCHOOL CALENDAR FOR 1905.

1905.

January 3,	Tuesday, Instruction resumed after Christmas recess.
January 28,	Saturday, Founders' Day.
February 3,	Friday, Registration for the Second Semester.
February 6,	Monday, Instruction begins.
June 12,	Monday, Summer School begins.
June 15,	Thursday, Annual Commencement of the University.
July 29,	Saturday, Summer School ends.
September 19,	Tuesday, Registration for the First Semester.
September 21,	Thursday, Instruction begins.

**Thanksgiving Recess from Thursday, November 30, to Sunday, December 3, Inclusive.**

**Christmas Recess from Thursday, December 21, to Tuesday, January 2, Inclusive.**

1906.

January 3,	Wednesday, Instruction resumed.
January 28,	Sunday, Founders' Day.
February 8,	Thursday, Midyear Graduation Exercises.
February 9,	Friday, Registration for the Second Semester.
February 12,	Monday, Instruction begins.
February 22,	Washington's birthday.
June 18,	Monday, Summer School begins.
June 21,	Thursday, Annual Commencement of the University.

**Summer Vacation from Friday, June 22, to Monday, September 24, Inclusive.**

August 5,	Saturday, Summer School ends.
September 25,	Tuesday, Registration for the First Semester.
September 27,	Thursday, Instruction begins.

OFFICERS OF THE BOARD OF TRUSTEES OF NORTH-  
WESTERN UNIVERSITY.

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*President.*

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*Business Manager.*

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EXECUTIVE COMMITTEE OF THE SCHOOL OF  
PHARMACY.

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HENRY SHERMAN MAYNARD,

THEODORE HENRY PATTERSON, M.D.

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- THEODORE WHITTELSEY, PH.D. (University of Göttingen, Germany), *Professor of Inorganic and Analytical Chemistry, and Director of the Inorganic Chemical Laboratories.*
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- MAURICE ASHBEL MINER, PHARM.M. (University of Michigan), *Assistant Professor of Pharmacy, in charge of the Manufacturing Laboratory. Curator.*
- CHARLES WAGGENER PATTERSON, SC.B., PH.C. (Northwestern University), *Assistant Professor of Organic Analytical Pharmaceutical Chemistry, in charge of the Organic Chemical Laboratory. Registrar.*
- HARRY KAHN, PHARM.M. (University of Michigan), M.D. (Northwestern), *Assistant Professor of Physiology and Materia Medica.*
- DAVID CHARLES ECCLES, SC.B., A.M. (Columbia University), *Instructor in Pharmacy, in charge of the Dispensing Laboratory, Secretary of the Faculty.*
- GUSTAVE E. F. LUNDELL, SC.B. (Cornell University), *Instructor in the Inorganic Chemical Laboratories.*
- GERHARD H. JENSEN, SC.B. (Cornell University), *Instructor in Botany and Pharmacognosy.*
- JOHN FERD. FISCHNAR, PH.C. (Northwestern), *Assistant in the Pharmaceutical Laboratory.*
- WILLIAM HENRY HARRISON, PH.C. (Northwestern), *Assistant in the Chemical Laboratories.*
- ERNEST WOOLLETT, *Clerk, Instructor in Bookkeeping and Business Methods.*
- LEE RICHMOND GIRTON, PH.C. (Northwestern), *Lecture Assistant in Inorganic Chemistry.*

**BULLETIN**  
OF THE  
**SCHOOL OF PHARMACY**  
OF  
**NORTHWESTERN UNIVERSITY**  
**MARCH, 1905**

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**PROFESSOR ALBERT B. PRESCOTT.**

Professor Albert B. Prescott, Dean of the School of Pharmacy of the University of Michigan, the first university school of pharmacy in America, died on Friday, the 3d day of March, 1905, at the age of 73 years. Dr. Prescott rendered service of inestimable value to the cause of pharmaceutical education during a life time of great activity, and enjoyed the love and high esteem of the leading pharmacists of the country as an author, educator, and a man. Many honors were conferred upon him. He was actively connected with the work of revision of the Pharmacopoeia of the United States for many years. Dr. Prescott was an honorary alumnus of Northwestern University, which conferred upon him the degree of LL.D. in 1903.

**SCHOLARSHIPS IN THE SCHOOL OF PHARMACY.**

Upon the recommendation of the Executive Committee of the School of Pharmacy Northwestern University has established ten scholarships in that School, five to be awarded each year, the award to continue for two consecutive years and to yield to the holder one hundred dollars a year, payable in two equal installments, in September and February, to apply on tuition in the course of study leading to the degree of Pharmaceutical Chemist.

Applicants for such scholarships must meet the requirements for admission to the School as candidates for the degree of Pharmaceutical Chemist, and must register as regular candidates for that degree.

The awards will be made to those applicants who are best qualified for the study of Pharmacy, as judged by testimonials presented, affecting their general scholarship, character, and moral and physical vigor, and by the results of a competitive examination in Arithmetic and Elementary English to be held at the School on the Tuesday of the opening week in each year, or at such other time as the School may determine.

All applications and testimonials must be filed with the Dean of the School not less than one week before the opening of the School year in September. Testimonials issued by the Chicago Veteran Druggists' Association, the Chicago Druggists' Association, the Illinois State Pharmaceutical Association, or by any recognized Pharmaceutical Association will be given special consideration in making the awards.

Two scholarships will be awarded each year to candidates from Chicago and Cook County, two to candidates from Illinois outside of Cook County, and one to a candidate from outside of Illinois.

Scholarships may be cancelled at any time if the holder fails to maintain a proper standard either of scholastic work or of conduct.

The University reserves the right to discontinue the assignment of these scholarships at any time without notice.

#### **OCCUPATIONS OPEN TO GRADUATES OF THE SCHOOL OF PHARMACY OF NORTHWESTERN UNIVERSITY.**

Various occupations are more or less related to pharmacy in that they require in great part the same courses of preparatory training that are necessary to thorough pharmaceutical education. The courses given in the School of Pharmacy of Northwestern University open up to its students quite a number of occupations in which they can readily make practical use of their training. These occupations are very important ones, too. They are:

The Retail Drug Business as generally conducted.

Purely Professional-technical Pharmacy—not combined with general merchandising.

The Wholesale Drug Trade.

The Trade in Chemical Apparatus and Supplies.

Pharmaceutical Manufacturing Laboratories.

Chemical Manufacturing Laboratories.

Establishments for the Manufacture of Industrial Chemical Products of all kinds.

Positions as Pharmacists in the Army, the Navy and the Marine Hospital Service of the United States.

Analytical Chemistry and Microscopy in such lines of work as Commercial and Sanitary Public Analysts are called upon to do, including Food Chemistry and Bacteriology.

Graduates of this School are to be found in all the occupations mentioned.

#### **TRAINING TO MEET THE DEMANDS OF THE DRUG BUSINESS OF TODAY.**

The training necessary to true success in pharmacy includes not only the strictly professional-technical preparation for it which the best pharmaceutical schools always offer, but also that practical instruction in the actual daily routine of the druggist's occupation which every competent pharmacist's assistant must have before his services can be regarded as intelligent and satisfactory—the kind of training which a capable manager of a first-class, up-to-date pharmacy might give his assistants if he has the time to do so, but which the clerks in smaller pharmacies never get.

The School of Pharmacy of Northwestern University, with its unsurpassed equipment, large staff of experienced teachers and thorough courses, has always enjoyed the highest reputation for efficiency among the pharmaceutical schools of the world. No school of pharmacy, however, has yet undertaken to add to its curriculum a systematic course of lectures on the numerous medical and other supplies which every first-class pharmacy is now called upon to furnish to the public, but which are not included in the Pharmacopœia nor in the text-books. This school now offers such a course to all of its students as a part of the regular curriculum.

First-class pharmacies are everywhere called upon to furnish to the community many medical and sickroom supplies which are made by manufacturers. Among these supplies are dressings, bandages, plasters, gauzes, dietetic preparations for children and invalids, sanitary appliances and preparations, valuable medicinal preparations such as can not be made by the pharmacist himself, but which must be furnished by him, and often on the orders of physicians, and very many other things of a similar nature. The pharmacist should, therefore, have a sufficient knowledge of these products to handle them intelligently, serve his customers well, answer questions correctly, and to avoid, as far as possible, the causes of disappointment which are sure to attend the unintelligent vending of such goods.

The only effective method of making the student sufficiently familiar with the "ready-made" legitimate products referred to consists in giving him an opportunity to inspect them, as well as to hear about them. A complete assortment of representative examples of these products in original packages is now being collected for that purpose. This assortment will be fully as complete and varied as that represented by the stock of the most extensively equipped first-class pharmacies, so that all students in this school will see here all the classes of supplies which any well-trained and experienced pharmacist may be legitimately expected to be acquainted with.

Attention is also called to the new course of business training, including bookkeeping, which has been added to the curriculum.

#### **PENNSYLVANIA DEMANDS GRADUATION IN PHARMACY.**

Pennsylvania, following the example of the State of New York, has now a law, approved March 24, 1905, requiring graduation from a reputable school of pharmacy as a preliminary to registration and license. This new law is to take effect January 1, 1906.

With New York and Pennsylvania in the lead we may well expect other states to enact similar laws.

# THE SCHOOL OF PHARMACY

## OF

# NORTHWESTERN UNIVERSITY

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THIS SCHOOL was established in April, 1886. It was for some years known as "Illinois College of Pharmacy," but has always been a department of Northwestern University, of which it is an organic part.

NORTHWESTERN UNIVERSITY was chartered by the State of Illinois in 1851. In 1903-04 its College of Liberal Arts and its Schools of Medicine, Law, Pharmacy, Dentistry, Music and Theology had 2,819 students and the Academies 1,018, making a total of 3,837 students. Of these, 284 attended the School of Pharmacy.

This School is in NORTHWESTERN UNIVERSITY BUILDING, a seven-story edifice, 160x180 feet, in the heart of the City of Chicago (corner of Lake and Dearborn Streets). Twenty-six rooms, having a total floor space of about 27,000 square feet, including all of the fourth floor and two large rooms on the fifth floor, are used exclusively by the School of Pharmacy.

The value of Northwestern University Building and the ground upon which it stands is not less than one million dollars. The rental value of the quarters occupied by the School of Pharmacy is estimated to be, upon a commercial basis, about seven thousand five hundred dollars a year.

The furniture, fixtures, instruments, apparatus, books, museum specimens, drugs, chemicals and other materials in the School (February, 1905), are valued at \$26,400.

There are seven distinct LABORATORIES used exclusively by the School of Pharmacy. These laboratories have a total floor space of ten thousand seven hundred and eighty square feet and are provided with over three hundred individual

work tables, enabling that number of students to be concurrently at work. The several laboratories are: 1, the Qualitative Chemical Laboratory; 2, the Quantitative Chemical Laboratory; 3, the Organic Chemical Laboratory; 4, the Laboratory for Botany, Microscopy and Pharmacognosy; 5, the Manufacturing Laboratory (Pharmaceutical and Chemical); 6, the Dispensing Laboratory; and 7, the Bacteriological Laboratory.

There are two LECTURE ROOMS exclusively used by the School of Pharmacy, one seating one hundred and eighty-four and the other ninety-six.

Two STUDENTS' ROOMS are provided—one for men and one for women.

The MUSEUM contains over two thousand selected specimens of drugs, pharmaceutical and chemical products, industrial materials, etc.

The LIBRARY occupies about six hundred and forty-eight square feet of floor space, and contains about one thousand bound volumes and a large number of unbound volumes and pamphlets.

The total value of the books in the library is now (March, 1905) about three thousand four hundred dollars. They include complete sets of *Archiv der Pharmacie*, the *Proceedings of the American Pharmaceutical Association*, and the *British Pharmaceutical Journal*; complete sets of *Berichte der Chemischen Gesellschaft* from 1868 to date, and of *Chemisches Centralblatt* from 1870 to date; and, complete from 1893 to date, the *Berichte der Pharmaceutischen Gesellschaft*, *Zeitschrift f. Anorg. Chemie*, *Zeitschrift f. Anal. Chemie*, *Journal of the London Chemical Society*, the *Neueste Erfindungen u. Erfahrungen*, *Pharmaceutische Centralhalle*, *Repertoire de Pharmacie*, etc. All the pharmacopœias of the world are also in the library.

Students may obtain the necessary text-books at the College office at the lowest current prices, and whatever net profit is derived from the sale of these books is all of it applied to the support and increase of the library, which is open to all students every week-day from 9 o'clock A. M. to 5 o'clock P. M., except on Saturdays, when it is closed at 1 o'clock P. M.

The ANNUAL EXPENDITURES, including salaries, furniture, apparatus, materials, and all other necessary current school expenses, amount to about twenty-nine thousand dollars. It should be remembered, however, that this sum does not include rent.

The average ANNUAL ATTENDANCE during the nineteen years from 1886 to 1905, inclusive, has been two hundred and fifteen, counting no individual student more than once in any year.

The students of this School are drawn from all parts of the United States. The only States from which no students have come are Nevada and Delaware. About twenty-five States are represented in the classes every year.

The total NUMBER OF GRADUATES during the eighteen years from 1886 to 1904, inclusive, was one thousand five hundred and fourteen.

The COURSE FOR THE DEGREE OF GRADUATE IN PHARMACY embraces about 1,650 hours' instruction, including about 1,100 hours of required laboratory work, extending through fifty-four weeks, the average amount of work per week being about thirty hours. The whole course is divided into three equal parts, each occupying one semester of eighteen weeks. As the regular courses are given from September to June each year and the summer vacation extends through fourteen weeks (from the third Thursday in June to the third Thursday in September), the students are in attendance thirty-six weeks annually (exclusive of the Christmas recess). Each school year being divided into two semesters of eighteen weeks, and the several courses of instruction being given each semester, students may enter either in September (at the beginning of the first semester) or in February (at the beginning of the second semester). They may attend the School either nine months in the first year and four and one-half months the second year, or four and one-half months in the first year and nine in the second. All students take their courses in the same logical sequence whether they begin in February or September, so that those entering in February pursue the same studies from the beginning of that month to the end of the school year in June as are taken from September to February by the students who enter in the fall.

Students entering for the course leading to the degree of Graduate in Pharmacy must be at least eighteen years of age and must have a preliminary general education equivalent to that attained at the completion of the first year's work of a high school of the best grade, or its equivalent, or they must be persons registered upon examination by the pharmacy boards and accordingly and legally entitled to practice pharmacy.

The COURSE FOR THE DEGREE OF PHARMACEUTICAL CHEMIST embraces about 2,370 hours' instruction, including about 1,760 hours' laboratory work. It extends through four semesters of eighteen weeks each, or, in other words, two years of nine months each.

Students entering for the course leading to the degree of Pharmaceutical Chemist must have a preliminary general education equivalent to that attained by graduation from a high school of the best grade.

The REQUIREMENTS FOR GRADUATION (either as Graduate in Pharmacy or Pharmaceutical Chemist) include legal maturity (the age of twenty-one years) and good moral character. Students desiring to enter this School who have satisfactorily completed one or more courses of study in another college of good standing may receive due credit for their work upon presentation of proper credentials, but all candidates for graduation must complete all the required work included in the courses given in this School and must attend this School not less than two semesters (nine months).

The staff of the School consists of: Oscar Oldberg, Pharm.D., Dean., Professor of Pharmacy and Director of the Pharmaceutical Laboratories; Harry Mann Gordin, Ph.D. (University of Berne, Switzerland), Professor of Organic Chemistry and Director of the Organic Chemical Laboratory; Theodore Whittelsey, Ph.D. (University of Göttingen, Germany), Professor of Inorganic and Analytical Chemistry and Director of the Inorganic Chemical Laboratories; Raymond H. Pond, Ph.D. (University of Michigan), Professor of Botany, Microscopy, Pharmacognosy and Bacteriology, and Director of the Microscopical and Bacteriological Laboratories; Maurice Ashbel Miner, Pharm.M.

(University of Michigan), Assistant Professor of Pharmacy, in charge of the Manufacturing Laboratory, Curator; Charles Waggener Patterson, Sc.B., Ph.C. (Northwestern University), Assistant Professor of Organic Analytical Pharmaceutical Chemistry, in charge of the Organic Chemical Laboratory, Registrar; Harry Kahn, Pharm.M. (University of Michigan), M.D. (Northwestern University), Assistant Professor of Physiology and Materia Medica; David Charles Eccles, Sc.B., A.M. (Columbia University), Instructor in Pharmacy, in charge of the Dispensing Laboratory, Secretary of the Faculty; Gustave E. F. Lundell, Sc.B. (Cornell University), Instructor in the Inorganic Chemical Laboratories; Gerhard H. Jensen, Sc.B. (Cornell University), Instructor in Botany and Pharmacognosy; John Ferd. Fischnar, Ph.C. (Northwestern), Assistant in the Pharmaceutical Laboratory; William Henry Harrison, Ph.C. (Northwestern), Assistant in the Chemical Laboratory; Ernest Woollett, College Clerk, Instructor in Book-keeping and Business Methods; Lee Richmond Girton, Ph.C. (Northwestern), Lecture Assistant in Inorganic Chemistry.

All of these teachers devote their whole time to this School, with the exception of the professor of physiology and materia medica, who has no laboratory courses under his charge, and the lecture assistant in inorganic chemistry.

The professors are provided with private offices and laboratories for the effective performance of their duties under the most favorable conditions and for research work.

#### EXPENSES AND DEPOSITS.

Matriculation fee, \$5.00.

The matriculation fee is payable only once and before registration. It is not returnable under any circumstances.

Tuition for all courses of instruction, one term or semester of eighteen weeks.....	\$55.00
Drugs, chemicals and other materials consumed in the laboratory work, each term.....	10.00
Fee for the use of instruments and apparatus and for their maintenance, each term .....	2.00
Deposit required to cover breakage or loss of apparatus and other school property .....	8.00

Aprons, sleeves, note-books, pencils, spatulas, dissecting needles, rubber tubing, and various other articles with which the

students must supply themselves for individual use are furnished by the School for their convenience at cost prices; but to avoid bookkeeping each student is required to obtain a coupon ticket to the amount of \$5.00. The prices of the articles are punched out of the coupon ticket, and any unused coupons are redeemed at the end of the school term. Supplies of this kind are issued in no other way, but the student may purchase them wherever he sees fit.

The diploma fee is \$10.00.

Individual lockers in which students may keep their hats, coats, books and other articles, are furnished to all students free of charge.

No tuition or other fees are refunded except in case of the student's illness. In that case, if the student presents a certificate from a physician that he is unable to remain in attendance, and a statement from the Dean of the School that he is in good standing, one-half of the current semester's fees will be refunded, provided application is made before the middle of the semester.

#### **BOARD AND ROOM.**

Good board and room together can be secured near the School at from \$4.00 to \$6.00 per week. Students may also secure rooms and board separately. Information in regard to these matters and addresses of reliable and satisfactory private boarding places and furnished rooms will be supplied at the college. Good accommodations are plentiful, and satisfactory arrangements can be quickly made by each student immediately upon his arrival. It is wholly unnecessary and rarely advantageous to secure board and room in advance.

The Young Men's Christian Association has a special College Bureau for the professional schools of Northwestern University located in this building, and every student receives prompt, efficient and courteous personal attention and aid at that Bureau.

#### **THE SUMMER SCHOOL.**

A Summer School term of about seven weeks' work is offered to special students. Lectures are not given during that term, but such laboratory work only as is usually and properly done in summer sessions. Pharmacists—gradu-

ates and non-graduates—who may desire to take one or more of the laboratory courses in this School can do from twelve to thirty-six hours' work weekly. Students who wish to review one or two courses may do so conveniently in the summer term. Nearly all of the laboratory courses described in this Bulletin are given in the summer; but special students must make application before the first day of June. The Summer School opens on Monday, the 12th of June, and ends on Saturday, July 29, 1905.

For further information address the Dean of the School of Pharmacy, Northwestern University Building, 87 Lake Street, Chicago, Ill.

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## COURSES IN CHEMISTRY.

In response to numerous requests Northwestern University is opening the facilities of the University Building at the corner of Lake and Dearborn Streets, Chicago, to students who wish to prepare themselves for the occupation of general, sanitary and commercial analytical chemists and microscopists and for work in chemical and pharmaceutical manufacturing laboratories. The program of work arranged for this purpose is designed to prepare the student for the duties to be performed by chemists and microscopists under the food and drug laws, as well as for other work usually performed by public analysts or commercial chemists, and it includes also mineralogy and mineral assaying. It is believed that the rapid growth of the chemical industries of the country and the adoption of national and state pure food and drug laws will largely increase the demand for such workers.

The instruction will be given in the laboratories of the University's School of Pharmacy, which occupies the entire fourth floor of the University Building. The building is at the edge of the wholesale district of the city and the business houses dealing in the most varied products of the chemical industries are represented in the immediate neighborhood. Its easy access to all the means of transportation, extending into the manufacturing and industrial districts of Chicago, bring these also within reach of the students.

The library of the School of Pharmacy contains a well-selected working library of standard text-books, dictionaries, monographs and other reference books on pure chemistry and on analytical and industrial chemistry.

Current numbers of the principal chemical journals are received and the library contains complete files of a number of such journals. (See p. 11.) The John Crerar Library, which is the scientific library of the city and is unusually complete in chemical literature, is within five minutes' walk.

The program of work extends through four terms of eighteen weeks each. Lectures are given on inorganic, organic and analytical chemistry and in mineralogy, botany and microscopy, together with laboratory training in general inorganic and organic chemistry, qualitative and quantitative analysis. Special courses will be given in the analysis of iron ores, iron and steel, slags and cement, the "wet assay" of ores of copper, lead and zinc and the "fire assay" of ores of gold and silver; the examination of water, milk, butter, cheese, beverages, drugs, oils, fats, soaps, etc.; in commercial microscopy as applied to drugs, spices, food-stuffs, textiles and other commodities, and in the manufacture of pure chemical and pharmaceutical preparations from the raw materials.

The laboratory work in this program amounts to over 1,700 hours, extending through two years.

Certificates in due form will be given upon satisfactory completion of these courses.

The laboratories in which the work is carried on are described on p. 10, with the exception that the work in mineralogy and the "fire assay" of ores, is given in the Fayerweather Hall of Science at Evanston.

Students to be admitted to this course must have a preliminary general education equivalent to that attained by graduation from a high school of the best grade.

For information with reference to tuition and other expenses, see pages 13 to 14.

## COURSES

offered in the School of Pharmacy of Northwestern University for the degrees of Graduate in Pharmacy,, Pharmaceutical Chemist and Master of Pharmacy, and for the training of Analytical Chemists and Microscopists.

These courses are required to be taken by all students unless otherwise indicated in brackets at the end of each descriptive paragraph. Additional courses required for the degree of Graduate in Pharmacy are indicated by Ph. G.; those required for the degree of Pharmaceutical Chemist by Ph. C., and those for Analytical Chemists and Microscopists by Ch.

## A. Inorganic and Analytical Chemistry.

COURSE A1.—*General Inorganic Chemistry*.—An introductory course in which the student lays the foundation necessary for successful work in the other courses in chemistry and in the courses in pharmacy. The elementary principles of the science are developed in connection with the consideration of oxygen, hydrogen, nitrogen, and the other especially important non-metallic elements. This is followed by a systematic study of all the common chemical elements and their compounds.

Lectures, illustrated by experiments, three hours weekly; recitations, two hours weekly; through eighteen weeks. Total, about 90 hours.

This is accompanied in the laboratory by courses A2 and A3a.

COURSE A2.—*General Inorganic Chemistry, Laboratory Work*.—This course, together with the lectures and recitations described in course A3a and course A1, form an integral course, the discussion of the theories of the science in the lecture room being based in large part on the experiments performed in the laboratory. There the student prepares the more important elements and their compounds and observes the physical and chemical properties of each. Emphasis is laid on the logical and discriminating interpretation of the results of the experiments.

About twenty-seven laboratory periods of three hours each, extending through about nine weeks. Total, about 80 hours.

COURSE A3a.—*Qualitative Analysis*.—Study in the laboratory and class room of the methods of separation and identification of the principal bases and acids, together with the reactions involved.

In this course the practical requirements of the pharmacist and chemist in the intelligent application of the identity and purity tests of the Pharmacopœia are kept in view.

About twenty-seven laboratory periods of three hours each, with recitations and written reviews, one or two hours weekly through nine weeks. Total, about 96 hours.

COURSE A3β.—*Qualitative Analysis*.—The analysis of mixed substances, the composition of which is unknown to the student,

and the detection of impurities in pharmaceutical and commercial chemicals.

One lecture or recitation weekly and twenty-seven laboratory periods of three hours each through nine weeks. Total, about 96 hours.

**COURSE A4.—*Quantitative Analysis, Chiefly Volumetric.***—An introduction to the methods and underlying principles of quantitative analytical work through the study of typical methods. Due attention is paid to the use of the standard "volumetric test-solutions" of the Pharmacopœia.

One lecture or recitation weekly and twenty-seven laboratory periods of three hours each through nine weeks. Total, about 96 hours.

**COURSE A5.—*Quantitative Analysis, Chiefly Gravimetric.***—This course of laboratory practice in gravimetric methods of analysis includes twenty-seven laboratory periods of three hours each. Total, about 80 hours.

(Ph. C. and Ch.)

**COURSE A6.—*Urine Analysis,*** qualitative and quantitative. The detection and determination of constituents of urine which are of importance in the diagnosis of disease.

Twenty-seven laboratory periods of three hours each. Total, about 80 hours.

**COURSE A7.—*Engineering Analysis.***—An extension of courses A4 and A5 embracing the analysis of materials of technical and industrial importance. The analysis of coal, flue gases and illuminating gas; the determination of the heating power of coal; the analysis of iron ores, iron and steel, slag, cements and cement materials; alloys; and the wet assay of ores of copper, lead, zinc, etc.

The extent of this course varies according to the work selected from the above list.

From fifty-four to ninety laboratory periods of three hours each. Total, 160 to 270 hours.

(Ch.)

## **B. Botany, Microscopy and Pharmacognosy.**

**COURSE B1.—*General Botany,*** including Organography and Taxonomy.—A course of lectures and recitations designed to give the student a good general conception of the great plant groups, to present the facts most essential to an intelligent study of vegetable drugs, to elaborate and recapitulate the lessons of the work in the microscopical laboratory, and to impart a knowledge of the classification of plants and the rules of nomenclature.

About two hours weekly through eighteen weeks. Total, 36 hours.

**COURSE B2a.—*The Microscope and How to Use It.***—A study of the optical properties of mirrors and lenses especially applied to the mechanism and manipulation of the compound microscope. Actual practice in manipulation is given, including methods of determining magnification.

The very best imported instruments with 1-inch and  $\frac{1}{4}$ -inch objectives, two eye-pieces, double nose-piece, coarse and fine adjustment, and all other important accessories, are furnished to all students.

This course is a necessary preparation for course B2 $\beta$ , B3 and B4.

Five hours weekly as a part of and an introductory to course B2 $\beta$ .

**COURSE B2 $\beta$ .—*The Microscopic Structure of Plants.***—A laboratory course especially designed to prepare the student for the examination of drugs and other vegetable raw materials, with reference to the determination of their identity and quality, and for the detection of adulterations in powdered substances. Particular emphasis is placed upon the anatomy of roots, stems and leaves. A special study is made of starch granules, aleurone and crystals. Each student is assigned a microscope for his own individual use and is furnished with an especially prepared laboratory guide. Cutting sections, preparation of mounts and use of micro-reagents are daily practiced.

Five hours' laboratory work weekly through eighteen weeks, including course B2 $\alpha$ . Total, about 90 hours.

**COURSE B3.—*Pharmacognosy.***—A study of medicinally and industrially important plant substances. About two hundred of the most important drugs, spices and other raw materials of vegetable origin are thoroughly studied. A study is made of the outer and, in many cases, the inner structures. Notes are made of the characteristic features, and spurious articles and adulterants also examined. Special effort is made to develop a capacity to intelligently interpret and apply the pharmacopœial descriptions for the identification of drugs and to form a correct judgment of their quality. Demonstrations are made from specimens of drugs and other substances likely to be confused with each other, but which may be distinguished by their respective structural differences.

The laboratory is abundantly supplied with materials, both dry and alcoholic, permanent mounts and choice museum specimens.

Five hours' laboratory work weekly through eighteen weeks, with lectures and recitations one hour weekly. Total, about 108 hours.

**COURSE B4.—*Commercial Microscopy.***—A course designed to afford the requisite training for the duties of the Pharmaceutical Chemist and Public Microscopist, including the examination of powdered drugs, spices, food-stuffs, etc. Specially prepared cross and longitudinal sections of whole specimens are supplied for comparison with the tissue elements as found in powders. A thorough study of the various kinds of starch is made. Hairs and textile fibers are studied. Training is given in microtechnique, including micrometry and work with the camera lucida and polariscope. Special methods for the isolation and determination of the structural elements of woods, stems, leaves, barks, roots, rhizomes, seeds, fruits, glands and spores.

The laboratory is amply supplied with appropriate reagents. Six hours weekly through eighteen weeks. Total, 108 hours. (Ph. C. and Ch.)

### C. Organic Chemistry.

**COURSE C1.—General and Pharmaceutical Organic Chemistry.**—A course of lectures and recitations on the general principles of organic chemistry, with the study of the most important carbon compounds and their classification. Particular attention is given to substances employed in medicine and pharmacy, such as the important alcohols, ethers, aldehydes, acids, esthers, ketones, certain compounds of the aromatic series, the so-called "synthetics" of the newer materia medica, etc.

Lectures and recitations five hours weekly, extending through eighteen weeks. Total, about 90 hours.

**COURSE C2.—Laboratory Course in Pharmaceutical Organic Analysis.**—Training in the performance of certain pharmacopœial processes of assay, including the valuation of preparations of opium, cinchona and nux vomica and of citrate of iron and quinine, spirit of nitrous ether, etc. The valuation of pepsin, pancreatin, and malt extract, the estimation of alcohol in liquids, etc.

Thirty-six laboratory periods of three hours each, extending through eighteen weeks. Total, 108 hours.

**COURSE C3.—Special Course on Alkaloids, Glucosides, etc.**—A course of about thirty-six lectures upon the alkaloids, glucosides and other definite chemical compounds contained in drugs and other plant substances. Their composition, separation, identification, properties and relationships. Total, 36 hours.

(Ph. C. and Ch.)

**COURSE C4.—Advanced Pharmaceutical Organic Analysis and Elementary Course in Organic Chemical Preparations.**—Practice in the separation, identification and estimation of alkaloids. Further work in the official methods of assaying drugs and preparations. The examination of organic substances for the detection of impurities and adulterations. Practical study of methods of taking melting points and boiling points. Quantitative estimations of certain solutions and preparations, such as formaldehyde, etc. The preparation of some organic chemical compounds.

Fifty-four laboratory periods of three hours each, extending through eighteen weeks. Total, about 160 hours.

(Ph. C. and Ch.)

**COURSE C5.—Food and Sanitary Analysis.**—The examination of water to determine its potableness and fitness for household uses, and the examination of milk, butter, cheese, beverages, and food products generally, and such other work as is usually required of public analysts for sanitary purposes.

One lecture or recitation and nine hours' laboratory work weekly, through eighteen weeks. Total, about 180 hours.

(Ph. C. and Ch.)

**COURSE C6.**—*Industrial Organic Analysis and Additional Work in the Preparation of Organic Compounds.*—Water analysis. The examination of oils, fats and waxes, soaps, and other industrial materials and products. The estimation of carbon, hydrogen, nitrogen, and halogens in organic compounds. Molecular weight estimations for volatile substances and solid non-electrolytes.

One lecture or recitation and three laboratory periods of three hours each, weekly, through one semester of eighteen weeks. Total, about 180 hours.

Elective.

#### **D. Human Anatomy and Physiology.**

A course of eighteen lectures and recitations intended to sufficiently acquaint the student with the morphology and physiology of the human body to enable him to understand the processes of digestion, assimilation, circulation, respiration and nerve action, and the physiological action of drugs.

Total, 18 hours.

#### **E. Materia Medica and Therapeutics.**

About thirty-six lectures and recitations on the properties, action, uses and doses of drugs and their preparations, together with a discussion of poisons and their toxic effects and antidotes.

Total, 36 hours.

#### **F. Manufacturing Pharmacy and Chemistry.**

**COURSE F1.**—*Materials.*—Preparatory study of the materials used in the manufacture of pharmaceutical, chemical and industrial products.

This course is designed to impart to the student a sufficient degree of practical familiarity with the general character and properties of important classes of raw materials, out of which he must later make finished preparations. Both inorganic and organic raw materials are discussed to the extent to which this may be profitably done in advance of the study of their chemistry, to which this practical introduction to their physical properties is a most helpful preliminary.

The general physical properties and behavior of the most important classes of constituents of plants, such as cellulose, starch, pectin, mucilage, sugars, albumin, fixed oils, volatile oils, resins, tannin, amara, glucosides and alkaloids are reviewed sufficiently to render the practical study of their extraction or elimination, and the manufacture of preparations of plant substances, intelligent and effective.

About eighteen lectures and recitations. Laboratory work supplementing the lessons taught in these lectures is included in course F3.

Total, 18 hours.

**COURSE F2.—Manipulations.**—A preparatory course of lectures and recitations on laboratory operations employed in making and purifying pharmaceutical, chemical and other industrial products. The course covers such processes as those of powdering, solution, filtration, evaporation, crystallization, distillation, precipitation, methods of extraction, including percolation, etc.

Laboratory practice is given in course F3.

Eighteen lectures and recitations. Total, 18 hours.

**COURSE F3.—Preparatory Laboratory Course in the Study of the Materials and Operations of Manufacturing.**—Experimental work on the physical properties and behavior of the raw materials and constituents referred to in course F1. The separation of the constituents from the crude plant substances and from each other, and the manufacture of certain products in the preparation of which the general character of the materials may be most effectively studied.

The manipulations discussed in course F2 are exemplified by actual practice and the work selected is such as will best familiarize the student with the apparatus employed, the most common materials operated upon, the methods and manipulations, and the simpler preparations. Thus a part of the work consists of examples of the purification of commercial chemicals by recrystallization and by other means. The inorganic substances operated upon include the most common metals, the common acids and alkalies, oxides, salts and other compounds, with which the student thus acquires a sufficiently extensive and living practical familiarity to greatly facilitate his grasp of the science of chemistry.

This course consists of thirty-six laboratory periods of three hours each through eighteen weeks. Total, about 108 hours.

**COURSE F4.—Preparations of Organic Drugs.**—Extracts of all kinds, such as tinctures, wines, fluid extracts, solid extracts, oleoresins, precipitated resins, etc. Discussion of the relation of the constituents of the materials to the methods employed in the manufacture of the products mentioned. All important individual preparations are given special attention.

Lectures and recitations, two hours weekly, through eighteen weeks. Total, 36 hours.

**COURSE F5.—Applied Inorganic Pharmaceutical and Manufacturing Chemistry.**—The principles specially governing the processes by which inorganic chemical products are made. The selection of materials and methods. Since the chemical products which are pharmaceutically important embrace not only the chemicals which are used in medicine alone, but almost all the products which are industrially important, this course covers practically all kinds of inorganic chemical preparations.

Lectures and recitations two hours weekly through eighteen weeks. Total, 36 hours.

Supplemented by courses F3 and F6.

**COURSE F6.—Laboratory Practice in the Manufacture of Inorganic Chemical Preparations.**—A great variety of inorganic chemicals are manufactured by the students, including typical examples

of nearly all classes of compounds. Particular attention is given to pharmaceutical and industrial chemicals of special importance or interest or affording especially instructive practice. Among the raw materials employed in the Manufacturing Laboratory are many minerals and other crude natural products in order that students may have practical experience in making finished chemical preparations out of the cheapest and most common materials that can be successfully used. Other and purer materials are, of course, also employed whenever requisite. Hundreds of specimens of the products manufactured by the students are exhibited at the School and are open to inspection by any one interested.

Thirty-six laboratory periods of three hours each, extending through eighteen weeks. Total, about 108 hours.

**COURSE F7.—*Further Laboratory Practice in the Production of Miscellaneous Inorganic Pharmaceutical and Industrial Products.***—More advanced work in the Manufacturing Laboratory.

About thirty-six laboratory periods of three hours each. Total, 108 hours.

**COURSE F8.—*Laboratory Practice in the Preparation of Organic Products.***—The production of natural plant substances such as alkaloids and glucosides, and of the more common organic chemical preparations. Among the products made are, for instance, salicin, piperin, aloin, amygdalin, berberine, ether, chloroform, iodoform, acetic ether, nitrous ether, methyl salicylate etc.

About thirty-six laboratory periods of three hours each. Total, 108 hours.

(Ph.G.)

[Candidates for the degree of Pharmaceutical Chemist are given this course in the fourth term. They may obtain the degree of Graduate in Pharmacy on the completion of their work at the end of the third term receiving credit for Courses A5 and A6 instead of F8.]

## G. Pharmacy.

**COURSE G1.—*Weights, Measures and Pharmaceutical Arithmetic.***—Principles of metrology. The metric system. The customary weights and measures of America and Great Britain. Weighing and measuring. Balances and weights. Specific weight and specific volume. Instruments employed in determining mass and volume and their relations. Working formulas expressed in fixed quantities and in "parts by weight."

Actual practice in pharmaceutical problems connected with the metric system; the relations of weight and volume; percentage strength; problems in diluting and strengthening alcohol, solutions and preparations, and other calculations commonly occurring in pharmaceutical work and in manufacturing.

The importance of this course is best understood from the fact that no feature of the State Board examinations in pharmacy is more prominent than the questions in this direction.

Lectures, textbook work and class exercises, two hours weekly through eighteen weeks. Total, 36 hours.

COURSE G2.—*Extemporaneous Pharmaceutical Preparations and Dispensing*.—Powders, triturations, masses, troches, tablets, pills, capsules. Cataplasms, ointments, cerates, plasters, suppositories, bougies. Waters, mucilages, syrups, emulsions, mixtures. Infusions and decoctions.

Eighteen lectures and recitations. Total, 18 hours.

(Ph.G. and Ph.C.)

COURSE G3.—*Laboratory Course in Dispensing*.—It is now generally conceded that a systematic course of laboratory training in the art of making extemporaneous pharmaceutical preparations and in compounding and dispensing medicines must be a fundamental and crowning feature of any first-class school of Pharmacy. In the Dispensing Laboratory of the School of Pharmacy of Northwestern University (the first workshop of its kind) the student sees and learns to use an outfit of dispensing apparatus many times as extensive as can be found in many of the best drug stores together. Every student is required to make a great variety of extemporaneous preparations. The lessons are systematically prepared or selected with the view to include all important phases of work at the dispensing table with all kinds of materials and by all the different methods practiced. A practical experimental study of incompatibilities is included in this course.

Two laboratory periods of two hours each, weekly, through eighteen weeks. Total 72 hours.

(Ph. G. and Ph. C.)

COURSE G4.—*Miscellaneous Preparations and Products*.—Unofficial pharmaceutical, medicinal, surgical, sanitary, dietetic and other articles usually supplied by pharmacists, including surgical dressings, antiseptics, toilet preparations, perfumery, flavoring extracts, etc.

About 12 hours.

(Ph.G., and Ph.C.)

COURSE G5.—*The Pharmacopœia of the United States and Pharmacopœias of Other Countries*.—Lectures and recitations on the character, scope and functions of pharmacopœias. A systematic study of the essential distinctive features of the text of the American Pharmacopœia.

How it is constructed.

The principles of construction of systematic pharmaceutical nomenclature and its relations to proper classification of the medicinal substances. The bearings of the nomenclature upon scientific pharmacy. Latinic and non-latinic titles. Non-systematic names. The latinity of the American pharmacopœial nomenclature.

Every American student of pharmacy should own and study the Pharmacopœia of the United States, and in the School of Pharmacy of Northwestern University that law-book for the pharmacist is studied in the class room, book in hand. Each student is expected to have the text before him at every recitation.

Comparative study of the pharmacopœias of the world, their scope, their style of construction, *materia medica*, chemistry, pharmacy, nomenclature, preparations, and other important features.

A course of about twelve lectures. Total, 12 hours.

(Ph.G. and Ph.C.)

COURSE G6.—*The Professional-Technical Duties and Responsibilities of Pharmacists*, including the relations of pharmacists to the medical profession and the community.

*The Prescription*; its construction and interpretation. The prescription table and its problems. Dispensing.

The demands of modern scientific medicine upon the pharmacist of this century.

*Pharmacy laws*, poison laws, etc.

A course of about twelve lectures. Total, 12 hours.

(Ph.G. and Ph.C.)

## H. Bacteriology.

Lectures one hour weekly and laboratory work nine hours weekly through nine weeks. The most approved methods are taught.

Bacteria in health and disease. Culture media. Culture methods. Staining. Identification of some of the more common bacteria of earth, air and water. Toxins and antitoxins.

Non-pathogenic germs are first used for purposes of instruction. The common disease-producing bacteria are then studied.

The course is a practical one, enabling the student to fit himself to do successfully the bacteriological work ordinarily required for medical diagnosis and for sanitary purposes.

Total, about 136 hours.

Optional.

## I. Mineralogy, Blowpipe Analysis and Mineral Assaying.

COURSE 1.—*Mineralogy and Blowpipe Analysis*.—Mineralogy, elements of crystallography, descriptive mineralogy including physical properties, chemical composition, occurrence and association of minerals; determination of minerals by physical characteristics.

Blowpipe analysis.

Lectures and laboratory work, six hours weekly through eighteen weeks. Total, about 100 hours.

(Ch.)

COURSE 2.—*Mineral Assaying*.—Dry assaying of ores. Fire assay for base metals, and scorification, cupellation, parting and weighing of gold and silver. Crucible processes for assay of precious metals, and general methods for copper, lead and zinc.

Lectures and laboratory work, seven hours weekly through eighteen weeks. Total, about 120 hours.

(Ch.)

## J. Business Training.

A course of class exercises and practice continuing through eighteen weeks, one hour weekly, designed to teach the student

how the most common and essential commercial affairs connected with the drug business are conducted, including bookkeeping. Students are taught the nature and uses of invoices, bills, statements, orders, receipts, the banking business of the druggist, bills receivable and payable, drafts, notes, checks; they learn something of the meaning and uses of price lists and discounts, credits, collections, remittances, consignments, taking stock, partnership, commission; insurance, interest, taxes; contracts, leases, bills of sale, etc. This course is optional. Total, 18 hours.

## PH. G. AND PH. C. COURSES.

### Programmes.

(The letters refer to those used in the Description of Courses, pp. 17 to 26.)

### Ph. G. Course.

*First Term.*—A1, A2, A3a; B1, B2a, B2β; F1, F3.

10 lectures and 20 hours' laboratory work per week.

*Second Term.*—A3β, A4; B3; D; F4, F5, F6; J.

10 lectures and 20 hours' laboratory work per week.

*Third Term.*—C1, C2; E; F7, F8; G2, G3, G4, G5, G6.

10 lectures and 20 to 22 hours' laboratory work per week.

### Ph. C. Course.

*First and Second Terms* as in Ph. G. Course.

*Third Term.*—A5, A6; C1, C2; E; F7; G2, G3, G4, G5, G6.

10 lectures and 20 to 25 hours' laboratory work per week.

*Fourth Term.*—B4; C3, C4, C5; F8.

## COURSE IN CHEMISTRY.

### Programme.

(The letters refer to those used in the Description of Courses, pp. 17 to 26.)

*First Term.*—A1, A2, A3a; B1, B2a, B2β; F1, F3.

10 lectures and 20 hours' laboratory work a week.

*Second Term.*—A3β, A4; B3; D; F4, F5, F6; J.

10 lectures and 20 hours' laboratory work a week.

*Third Term.*—A5, A6; C1, C2; E; F7; I1.

9 hours' lectures and 25 hours' laboratory work a week.

*Fourth Term.*—A7; B4; C3, C4, C5; 12.

5 hours' lectures and from 24 to 33 hours' laboratory work a week.

## GRADUATES—1904.

## Degree of Pharmaceutical Chemist.

Clothier, C. Roland,	<i>Polo.</i>
Good, Leonard Franklin,	<i>Salem, S. Dak.</i>
Harrison, William Henry,	<i>Danville.</i>
Kolar, Gustav Stanley,	<i>Chicago.</i>
Merriman, Frederick Stoughton,	<i>Moline.</i>
Potter, Maynard H.,	<i>Piggott, Ark.</i>
Spear Edward,	<i>Chicago.</i>

## Degree of Graduate in Pharmacy.

Ayres, Otto Elwood,	<i>Ottumwa, Ia.</i>
Benedict, Philip Vincent,	<i>Grand Rapids, Mich</i>
Brean, Walter Thomas,	<i>North Chicago.</i>
Burt, Hugh Valentine,	<i>Chicago.</i>
Burton, Oscar,	<i>Falmouth.</i>
Cissell, Orville B.,	<i>Toulon.</i>
Clark, Jay G.,	<i>Mineola, Tex.</i>
Claybough, Henry Lloyd,	<i>Wayne, Neb.</i>
Cooper, Harry Talbot,	<i>Robinson.</i>
Cooper, Howell Gazeway,	<i>Lindale, Tex.</i>
Cowan, John G.,	<i>Milford.</i>
Dubsky, Frank,	<i>Chicago.</i>
Duncan, Howard William,	<i>DeKalb.</i>
Elliott, Delmar Clifford,	<i>Wilmington.</i>
Evernden, William Blaine,	<i>Hinsdale.</i>
Ferrell, Oran Luther,	<i>Gilmer, Tex.</i>
Frutiger, Jacob,	<i>Olney.</i>
Gilbert, Menzies Eli,	<i>Mt. Vernon.</i>
Gregg, Arthur William,	<i>Bloomington.</i>
Greenwell, Elmer LeRoy,	<i>Farmington.</i>
Grinnolds, Emma Maude,	<i>Mauston.</i>
Guthrie, William James,	<i>Tacoma, Wash.</i>
Hallock, Frank William,	<i>Paw Paw.</i>
Harrison, William Henry,	<i>Danville.</i>
Hartig, Alfred Julius,	<i>Dubuque, Ia.</i>
Hennings, Raleigh M.,	<i>Albert Lea, Minn.</i>
Holke, William Henry,	<i>Freeport.</i>
Holliday, William Warren,	<i>Madison, S. Dak.</i>
Horton, Ira Marlow,	<i>Aurelia, Ia.</i>

Huntley, Roy,  
Jaderstrom, Louis William,  
Joder, Earl Bickley,  
Johnson, John Carl,  
Kay, Carl Cecil,  
Keesecker, Frank Charles,  
Keller, George Theodore,  
Kelly, Marcella Geneva,  
Kennedy, John Eugene,  
Kierland, Lewis Richard,  
Kozlowski, Benjamin Roman,  
Kuehn, William,  
Lee, Arne E.,  
Margadant, William,  
McCullen, George A.,  
Merz, Lee Nichols,  
Metzger, Royal Jacob,  
Meyer, Bertram M.,  
Miller, James Emerson,  
Moors, Claude W.,  
Morgan, Harmon Kiefer,  
Morris, Sampson,  
Moyer, John Walter,  
Musselman, Claude John,  
Neill, Frederick Winthrop,  
Pepin, Louis Arthur,  
Reay, John Garfield,  
Rink, Arthur Francis,  
Ritter, Frank Joseph,  
Robin, Samuel,  
Roland, Ingevald Burnhardt,  
Ross, J. Leonard,  
Saccar, Michael,  
Schenk, Albert Leopold,  
Scott, Marc William,  
Sime, Hyman,  
Spear, Edward,  
Speetzen, Gustav,  
Starrett, Roy Samuel,  
Stebbins, Arthur Percy,  
Tannus, Shukri Faris,  
Thompson, George Haywood,

Sharon, Wis.  
Kewanee.  
Waterloo, Ia.  
Red Wing, Minn.  
Big Sandy, Tex.  
Dubuque, Ia.  
Orangeburg. S. Car.  
Dixon.  
Chicago.  
Rushford, Minn.  
Chicago.  
Chicago.  
Canton, S. Dak.  
Waterloo, Ia.  
Highmore, S. Dak.  
Chicago.  
Shellrock, Ia.  
Tecumseh, Mich.  
Atlantic, Ia.  
Grand Rapids, Wis.  
Clinton, Ind.  
Chicago.  
Crawford, Neb.  
Danvers.  
Chandlerville.  
Grand Rapids, Wis.  
Wilmington.  
Geneseo.  
Mattoon.  
Chicago.  
Menominee, Wis.  
Clinton, Ia.  
Hallettsville, Tex.  
Chicago.  
Chamberlain, S. Dak.  
Toledo, Ia.  
Chicago.  
Davenport, Ia.  
Manito.  
Barron, Wis.  
Damascus, Syria.  
Spring Valley.

Thorp, Henley Lybrook,  
Tobie, Lester Guy,  
Turner, Jesse Blaine,  
Van de Bogart, Bert Ralph,  
Vlcek, Charles,  
Wangler, Anton Lotharius,  
Warrington, William Brace Girdle,  
Waterloo, Joseph Peters,  
Wellbrock, William,  
Woelke, John Henry,  
Wylie, John Tracy,

Chicago.  
Duluth, Minn.  
Santa Ana, Cal.  
Lake Geneva, Wis.  
Chicago.  
Waterloo, Ia.  
Pendar, Neb.  
Chicago.  
Peoria.  
Los Angeles, Cal.  
Tampico.

### MATRICULATES.

(April 1904 to April 1905. Matriculates whose names are followed by an asterisk (\*) did not attend. Students in the Junior Class are designated by 1; Seniors by 2.)

Arado, John Gregory August, 1...  
Chicago.  
Arduser, George, 1..Monticello, Ia.  
Ayles, Otto Elwood, 2.....  
Ottumwa, Ia.  
Bachelle, Percy v, 1.....Chicago.  
Barbee, John Snyder, 2.....  
Bozeman, Mont.  
Beans, Thomas Allen, 2.....  
Crawford, Neb.  
Bennett, Arthur Evald, 1..Chicago.  
Bensend, Floren Benwill, 1.....  
Whitehall, Wis.  
Berend, John Wallace, 1.....  
Waterloo, Ia.  
Bereznjak, Fannie, 1.....Chicago.  
Bergstrasser, Enos Ray, 1.....  
Madison, S. Dak.  
Biddle, Noble Maywood, 1.....  
Wilmington.  
Bingham, Charles C., 1.....  
Clinton, Ia.  
Blake, Charles William, 2.....  
Ogden, Utah.  
Blettner, Arthur Willam, 2.....  
Chicago.  
Blome, Fred Michael, 1...Clinton.  
Blount, Percy Thomas, 1.....  
Ottumwa, Ia.  
Bongart, Walter Michael, 2.....  
Champaign.  
Borling, Charles Decima, 1.....  
Chicago.  
Bourchier, Clarence, 1..Carbondale.  
Boyle, James Matthew, 1.....  
Ogden, Utah.  
Bradshaw, Edgar Hamilton, 1....  
Summit, Miss.  
Brean, Walter Thomas, 3.....  
North Chicago.  
Brent, William\*.....Chicago.  
Brice, Robert Hale, 1.....  
Due West, S. Car.

Brooke, Harry Sargent, 2.....  
Newark, N. J.  
Burhop, Albert Frederick, 2.....  
Chicago.  
Burkett, Guy Fred, 2.....  
Hawarden, Ia.  
Burt, Hugh Valentine, 2..Chicago.  
Calhoun, G. W., 1.....Chicago.  
Cavitt, Rivers Caldwell, 1.....  
Hickman, Ky.  
Chawgo, Harry Eugene, 2.Dundee.  
Chilcote, Roy Waters, 2.....  
Rosendale, Wis.  
Clark, Jay G., 2....Mineola, Tex.  
Claussen, Rudolph Henry, 1.....  
Manning, Ia.  
Claypool, Albert Beecher\*, Rantoul.  
Claypool, William Edward, 1.....  
Peoria.  
Code, Arthur F., 1.....Chicago.  
Collins, John Stephen, 1..Chicago.  
Conrad, Maurice, 1....Traer, Ia.  
Crosby, Ralph Carlos, 2....Aledo.  
Crowe, Thomas F., 1.....Chicago.  
Cummins, Delbert Emmet, 1.....  
Sullivan, Ind.  
Curry, Manco Frederick, 1.Chicago  
Czeslawski, Felix Alexander, 1....  
Chicago.  
Czosek, Robert Eugene, 1..Chicago.  
Dare, Harry Garfield, 1.....  
Morgan Park.  
Davies, John Edward, 3.....  
Spring Green, Wis.  
Davis, Mark Albert, 1.....  
Davenport, Wash.  
Davis, Orel T., 1..Mulberry Grove.  
Dayton, George Mayhew, 2.....  
Clinton, Ia.  
Dedman, Thomas Curry, 2.....  
Harrodsburg, Ky.  
Dickson, Laurence, 1.....  
Viroqua, Wis.

- Dougherty, Jetta Byrne, 2.....  
Newcastle, Neb.
- Dubsky, Frank, 2.....Chicago.
- Duffy, William D., 1..Columbus, O.
- Eggert, Emil Otto, 1....Chicago.
- Elliott, Delmar Clifford, 2.....  
Wilmington.
- Elliott, Robert, 3....Washington.
- Englehardt, Charles Francis, 1...  
Racine, Wis.
- Ennis, Lee Elrick, 2..Oelwein, Ia.
- Evernden, William Blaine, 2.....  
Hinsdale.
- Feltenstein, Maurice E., 1.Chicago.
- Ferrell, Oren Luther, 2.....  
Gilmer, Tex.
- Feuerbacher, Albert John Fred, 2...  
Lincoln.
- Feyder, Charles, 2.....  
Hartford, S. Dak.
- Finucane, F. F.\*.....Chicago.
- Fosselman, William Chris, 1.....  
Dubuque, Ia.
- Foster, Frank Homer, 2.....  
Glidden, Ia.
- Francy, George Paris, 2.....  
Salt Lake City, Utah.
- Freeman, Lewis Claude, 2.Chicago.
- Fritts, Roy Clifton, 2..Metropolis.
- Fullerton, James Thomas, 2.....  
Chicago.
- Gemmell, D. J., 1.....Oak Park.
- Getzloff, Henry, 1.....  
Grand Rapids, Wis.
- Gilbert, Menzis Eli, 2..Mt. Vernon.
- Gillisple, Jefferson S., 1...Chicago.
- Gillisple, Roy Sherman, 1.Chicago.
- Glenn, Thomas Michael, 1.Chicago.
- Goette, Gus Henry, 1....Chicago.
- Goodwin, Andrew John, 1.....  
Flat Rock.
- Gordon, Max Martin, 2...Chicago.
- Graham, Harry Day, 1.....  
Portage, Wis.
- Gsell, Earl Wilson, 2....Evanston.
- Guhin, John James, 1.....  
Maple Grove.
- Gunning, Charles Albert, 2.....  
Longmont, Colo.
- Guthrie, William James, 2.....  
Tacoma, Wash.
- Hall, Clarence Edwin, 1.....  
Rochester, Minn.
- Hallett, Charles, 2...Greely, Colo.
- Halling, Conrad, 1..Davenport, Ia.
- Hansen, George Conrad, 1.Chicago.
- Hanson, Paul Sidney, 1.....  
Pawnee, Neb.
- Harlan, Lawrence Leon, 2.....  
Hawarden, Ia.
- Harrison, William Henry, 3.....  
Danville.
- Harvey, Joseph H., 2.....  
Dyersville, Ia.
- Haynes, Pierre Evan, 1.....  
Elwood, Ind.
- Heaton, Ruby Franklin, 2.....  
Schrevelville, Ind.
- Heitmann, Frederick William, 1...  
Chicago.
- Hendrickson, Berent, 2.....  
Portland, N. Dak.
- Henkel, Arville Andrew, 1.Chicago.
- Hershey, Guy Floyd, 2..Taylorville.
- Hitchcock, Francis Elliott, 1.....  
Benton Harbor, Mich.
- Holke, William Henry, 2..Freeport.
- Holliday, William W., 2.....  
Madison, S. Dak.
- Holyoke, Thomas Stoddard, 1.....  
Grinnell, Ia.
- Horton, Ira Marlow, 2..Aurelia, Ia.
- Howard, True, 1.....Peoria.
- Howe, Henry W., 2.....Chicago.
- Hoyt, Sidney M., 1.....  
Springfield, Neb.
- Huard, George Napoleon, 2.....  
Chicago.
- Huntley, Roy, 2.....Sharon, Wis.
- Huss, Franklin Christ, 1.....  
Beardstown.
- Huwatcek, Edwin Joseph, 1.....  
Manitowoc, Wis.
- Haynes, William Henry, 1.....  
Dyersville, Ia.
- Jacobs, Asahel Eugene, 1...Malta.
- Jacobshagen, Robert Eldred, 1....  
Willow Lakes, S. Dak.
- Jaderstrom, Louis William, 2.....  
Kewanee.
- Jericho, Ernest, 2.....  
Mt. Pleasant, Ia.
- Johnson, Ever, 2..Menominee, Wis.
- Johnson, Magnus Godtfred, 1.....  
Fulda, Minn.
- Jordan, William Francis, 1..Peoria.
- Jorns, Gustave Carl, 1.....  
Portage, Wis.
- Kaczkowski, Joseph, 2....Chicago.
- Kaempfer, Robert, 1.....  
Rising City, Neb.
- Kassulke, August Erich Hugo, 1..  
Indianapolis, Ind.
- Kay, Carl Cecil, 2..Big Sandy, Tex.
- Keller, George Theodore, 2.....  
Orangeburg, S. Car.
- Keller, Neal Baker, 1..Taylorville.
- Kelting, William J., 1....Chicago.
- Kempf, Fred F., 1...Monticello, Ia.
- Kennedy, Frank, 1....Springfield.
- Kennedy, John Eugene, 2..Chicago.
- Kierland, Louis Richard, 2.....  
Rushford, Minn.
- Kille, Roy Porter, 1...Mason City.
- Kimmel, Frederick Joseph, 1.....  
Du Quoin.
- Klatt, Albert, 1.....Chicago.
- Klein, John, 1.....Hoopeston.
- Koehler, Cornelius Frederick, 1...  
Kankakee.
- Kolar, Gustave Stanley, 3.Chicago.
- Kotrba, William Edward, 1.....  
Chicago.
- Krauss, Arthur Schilk, 1.....  
Plymouth, Wis.
- Kuehn, William, 2.....Chicago.
- Lee, Arne E., 2....Canton, S. Dak.
- Lee, William Dorsey, 1....Cairo.
- Leischner, Eric Paul, 2...Chicago.

- Lewis, Arthur H., 2.....  
Canton, S. Dak.
- Levandowski, Frank D., 1.....  
Grand Rapids, Mich.
- Levengood, George Clarence, 1....  
Elsberry, Mo.
- Linder, Walter Henry, 1....Peoria.
- Locke, Wayne Foster, 2.....  
Clinton, Ia.
- Long, Charles I., 2.....  
Cedar Falls, Ia.
- Lord, Frederic William, 1.....  
River Forest.
- Lowell, Chester Reuben, 1.Chicago.
- Lucas, Edward Charles, 1.....  
St. Louis, Mo.
- Lyons, John Drayton, 2.....  
Menominee, Mich.
- Maag, Emil Rudolph Felix, 2.....  
Pana.
- Maisch, Charles Adams, 1.Chicago.
- Matthews, Joseph Sayers, 1.....  
Athens, Tex.
- Mauro, Edmond, 2.....Chicago.
- Mayer, John Arthur, 2....Freeport.
- McCann, Edward Bryce, 1.Chicago.
- McClure, Howe A., 1..Middletown.
- McCullen, George A., 3.....  
Highmore, S. Dak.
- McDill, Merbert Samuel, 1.....  
Port Neches, Tex.
- McHugh, Grover, 1.....El Paso.
- McKeon, Matthew J., 1.....  
Kansas City, Mo.
- McKibben, John Leslie, 1.....  
Christman.
- McKinney, John Robert, 1.....  
Carbondale.
- McLean, John Murdick, 2.....  
Schoenau, Tex.
- Meeker, Thomas C., 1.....  
Crown Point, Ind.
- Merz, Lee Nichols, 2.....Chicago.
- Meyer, Bertram M., 2.....  
Tecumseh, Mich.
- Midgett, Robert Ross, 1.Flat Rock.
- Meoney, John Hammel, 2.....  
Clinton, Ia.
- Moors, Claude W., 2.....  
Grand Rapids, Wis.
- Morgan, Harmon Klefer, 3.....  
Clinton, Ind.
- Morris, Sampson, 2.....Chicago.
- Mulvey, Leo Irvine, 2.Denver, Colo.
- Musselman, Claude John, 3.....  
Danvers.
- Neill, Frederick Winthrop, 2.....  
Chandlerville.
- Nitardy, Ferdinand, 1.....  
Owatonna, Minn.
- Nolan, Thomas James, 2.....  
Spring Valley.
- Nordling, Albert Josephus, 1.....  
Geneseo.
- Pace, Grover, 2.....Mondovi, Wis.
- Palmer, Charles Earl, 2..Morrison.
- Parker, Lloyd Warren, 1.Stockton.
- Petterson, Ella, 1.....Chicago.
- Petry, Herbert Arthur, 1.....  
Hoopeston.
- Phalen, Charles Stephen, 2.....  
Harvard.
- Prickett, Charles Caleb, 1.....  
Lewistown.
- Puhl, Adolph Albert, 2.....  
Menominee, Wis.
- Pyles, John Lindsey, 2.....  
Ft. Worth, Tex.
- Ranger, Carl Lee, 2.....Harvey.
- Reay, John Garfield, 2.Wilmington.
- Redmond, James W., 2.....  
Chippewa Falls, Wis.
- Reifert, J. Fred, 1.....  
Hartington, Neb.
- Reisl, Edwin G., 2.....Racine, Wis.
- Rex, Clarence R., 1.....Toledo, O.
- Rice, Evan Snyder, 1.....  
Pocatello, Idaho.
- Riester, Clarence Edward, 2.....  
Chippewa Falls, Wis.
- Roach, Stephen, 2.....Chicago.
- Roberts, Arthur John, 2.....  
Ogden, Utah.
- Robertson, Forrest Raymond, 1.....  
Houston, Tex.
- Robin, Samuel, 3.....Chicago.
- Ross, J. Leonard, 2.....Clinton, Ia.
- Rubenstein, Harry, 1.....  
Bucharest, Roumania.
- Rugg, Roger Frank, 2.Waterloo, Ia.
- Ruggles, Frederick Gilworth, 1....  
Kilbourne.
- Rushton, George Lord, 1..Minooka.
- Ryerson, Peter Emerson, 1.....  
Broken Bow, Neb.
- Saccar, Michael, 2.....  
Hallettsville, Tex.
- Scharringhausen, George L., 2.....  
Des Plaines.
- Schenk, Albert Leopold, 2.....  
Clinton, Ia.
- Scheurick, Martin Joseph, 1.....  
Champaign.
- Schillinger, Carl August, 2.....  
Rock Island.
- Schirmelfenig, Clarence, 1.Chicago.
- Schmidt, William Adolph, 2.....  
Madison, S. Dak.
- Schmitt, George John A., 1.....  
Quincy.
- Schmitz, Herb George, 1.....  
Decorah, Ia.
- Schneider, Joseph, 1..Dubuque, Ia.
- Schrag, Albert Henry, 1.....  
Cedar Falls, Ia.
- Schupmann, Martin, 1....Chicago.
- Schwartz, August H., 1.....  
Bloomington.
- Sexton, James Findley, 1...Aledo.
- Seyfert, Carl Reber, 1.....  
Circleville, O.
- Shennum, Arthur Clarence, 2.....  
Chicago.
- Shimerda, Edward F., 1.....  
Howard, S. Dak.
- Shine, J. Robert\*.....Mattoon.
- Sime, Hyman, 2.....Toledo, Ia.
- Smith, E. L., 1.....Chicago.
- Smith, J. W., 1..Indianapolis, Ind.
- Smith, Oscar, 1.....Newton.



## DIRECTORY.

The special announcements of the several departments of the University may be had on applications addressed as follows:

COLLEGE OF LIBERAL ARTS, *The Registrar*, University Hall, Evanston, Ill.

MEDICAL SCHOOL, *The Secretary*, 2421 Dearborn Street, Chicago.

LAW SCHOOL, *The Secretary*, Northwestern University Building, Chicago.

SCHOOL OF PHARMACY, *The Dean*, Northwestern University Building, Chicago.

DENTAL SCHOOL, *The Secretary*, Northwestern University Building, Chicago.

SCHOOL OF MUSIC, *The Secretary*, Music Hall, Evanston, Ill.

For information concerning the non-degree conferring departments, address

THE ACADEMY, Evanston, Ill.,

PROF. ARTHUR H. WILDE, PH.D., *Principal*.

GRAND PRAIRIE SEMINARY, Onarga, Ill.,

REV. FRANK G. BARNES, D.D., *President*.

ELGIN ACADEMY, Elgin, Ill.,

MR. GEORGE E. SLEIGHT, A.B., *Principal*.

For information concerning the Theological Schools, address as follows:

GARRETT BIBLICAL INSTITUTE,

REV. CHARLES J. LITTLE, LL.D., *President*.

NORWEGIAN-DANISH SEMINARY,

REV. NELS E. SIMONSEN, D.D., *Principal*.

SWEDISH THEOLOGICAL SCHOOL,

REV. ALBERT ERICSON, D.D., *President*.

For information concerning the School of Oratory, address

PROF. ROBERT L. CUMNOCK, L.H.D., *Director*,  
Evanston, Ill.

The Interstate School of Correspondence is located in the Studebaker Building, 378-388 Wabash Avenue, Chicago.



NORTHWESTERN UNIVERSITY BUILDING